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ABSTRACT

The Florida Competency-based Articulation Project sought to test the feasibility of using competency as a basis for articulation between and among community colleges and universities. In application, the exit level knowledge and skills required of graduates with AA degrees earned from community colleges and lower division programs in universities become the entry-level knowledge and skills for students entering upper division programs. These skills, described in terms of essential competencies, are agreed upon by faculty members from both community colleges and universities. During 1977-78, Phase II, 30 faculty members from two community colleges (Miami-Dade Community College and Broward Community College) and three universities (Florida Agricultural and Mechanical University, Florida State University, and University of North Florida) engaged in a process of identifying essential baccalaureate competencies and pilot testing competency assessment instruments under development by American College Testing Program and Educational Testing Service, as well as instruments developed by the project faculty themselves. The faculty determined the validity and reliability of these instruments for assessing certain competencies deemed essential for baccalaureate graduates to have mastered by the end of their college careers. The results of the investigation indicated that the tests were not perceived as valid measures of desired baccalaureate competencies by this interinstitutional group. Even though faculty seemed to become more accepting of competency-based education in general, they concluded that more work is required to describe precisely the nature of essential competencies and to develop valid competency assessments before competency-based articulation could become a reality. The methodology by which faculty acquired skills in competency identification and competency assessment is described. (Author)

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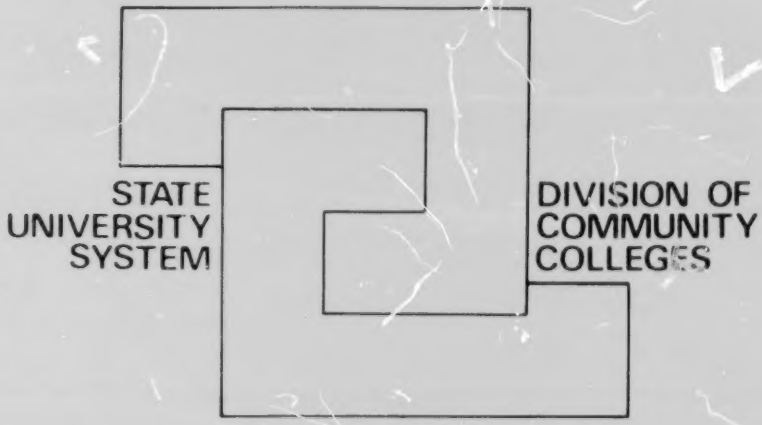
FINAL REPORT

FLORIDA COMPETENCY – BASED ARTICULATION PROJECT



PHASE II

THE IDENTIFICATION AND ASSESSMENT OF COMPETENCE

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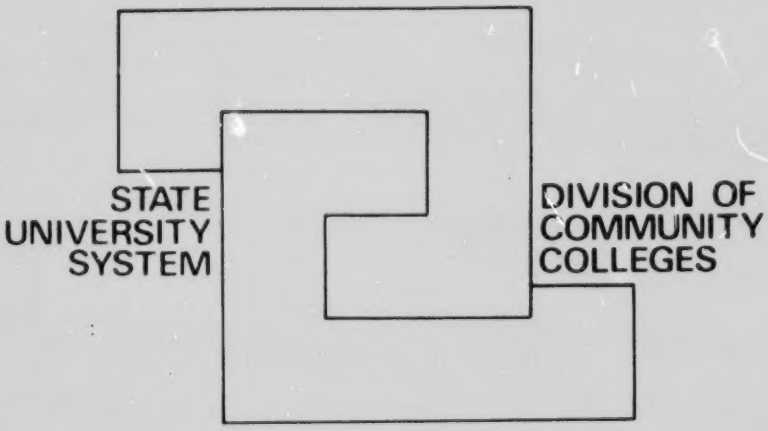

PHASE II

THE IDENTIFICATION AND ASSESSMENT OF COMPETENCE

Community Colleges	Universities
Broward Community College	Florida Agricultural and Mechanical University
Miami-Dade Community College	Florida State University
	University of Florida
	University of North Florida

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Willis Holcombe
Chairman, Project Executive Committee
Broward Community College

STAR Project 77-9062
University of North Florida
October 1977 - July 1978

PHASE II: COMPETENCY IDENTIFICATION

AND ASSESSMENT

of the

FLORIDA COMPETENCY-BASED ARTICULATION PROJECT. Final Report.

Abstract

The Florida Competency-based Articulation Project sought to test the feasibility of using competency as a basis for articulation between and among community colleges and universities. In application, the exit level knowledge and skills required of graduates with AA degrees earned from community colleges and lower division programs in universities become the entry-level knowledge and skills for students entering upper division programs. These skills, described in terms of essential competencies, are agreed upon by faculty members from both community colleges and universities. During 1977-78, Phase II, thirty faculty members from two community colleges (Miami-Dade Community College and Broward Community College) and three universities (Florida Agricultural and Mechanical University, Florida State University, and University of North Florida) engaged in a process of identifying essential baccalaureate competencies and pilot testing competency assessment instruments under development by American College Testing Program and Educational Testing Service, as well as instruments developed by the project faculty themselves. The faculty determined the validity and reliability of these instruments for assessing certain competencies deemed essential for baccaluareate graduates to have mastered by the end of their college careers. The results of the investigation indicated that the tests were not perceived as valid measures of desired baccalaureate competencies by this interinstitutional group. Even though faculty seemed to become more accepting of competency-based education in general, they concluded that more work is required to describe precisely the nature of essential competencies and to develop valid competency assessments before competency-based articulation could become a reality. The methodology by which faculty acquired skills in competency identification and competency assessment is described.

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Emerson G. Tully	Director, Research Services	Board of Regents, State University System, ex-officio

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FINAL REPORT

PHASE II: COMPETENCY IDENTIFICATION

AND ASSESSMENT

of the

FLORIDA COMPETENCY-BASED ARTICULATION PROJECT

October 1977 - August 1978

STAR 77--9062

Introduction

Historical Context

The Florida Statewide Articulation Coordinating Committee, in October 1975, appointed a special task force to explore the feasibility of using the demonstration of competence as a basis for articulation between community colleges and universities, as a possible alternative to the usual recognition of courses taken or credits earned. The initial functions of the task force (later to be designated the Project Executive Committee) were to identify institutions and personnel who wished to participate in establishing several pilot linking programs and to secure external funds from foundations or the federal government to support such an undertaking. The project became designated as the Florida Competency-based Articulation Project (FCBAP).

An initial grant was given by the Florida Department of Education to support costs for promoting the project and for securing institutional commitments. At first, the project focused on establishing competency-based linkages between pairs of institutions in professional or occupational programs, since it was speculated that it would be easier to identify and to agree upon competencies in these areas than in liberal arts areas or

general education. Furthermore, considerable experience had been gained from working with the occupational programs in the Curriculum of Attainments project at FSU in implementing competency-based programs. Institutuions and programs identified were: Architecture with University of Florida (UF), Florida Agricultural and Mechanical University (FAMU), Miami-Dade Community College (MDCC), and St. Petersburg Junior College (SPJC); Business with University of South Florida (USF) and Hillsbourough Community College (HCC); Biology with Florida Technological University (FTU) and Valencia Community College (VCC); and Industrial Technology with University of North Florida (UNF) and Florida Junior College at Jacksonville (FJC).

A proposal to establish these four experimental pilot linking programs was submitted to the Carnegie Corportaion which had earlier expressed an interest in supporting cooperative interinstitutuional programs organized under a statewide aegis. However, program officers at Carnegie felt that the impact from implementing occupationally-oriented programs, even if they were successful, would be too limited and hence encouraged the project staff to consider a competency-based articulation project in the area of general education. The Caregie officials reasoned that the occupational programs would affect only several hundred students per year, but that competency-based general education programs would impact on thousands.

Taking their advice, the FCBAP leadership expended the project to include a general education component.

The new proposal included the establishment of four linking occupational/professional programs, as well as a general education program and a joint assessment center shared between Miami-Dade Community College (MDCC) and Florida International University (FIU). Four funding sources were invited to share in the costs of this comprehensive project: Carnegie Corporation,

Kellogg Foundation, and the Fund for the Improvement of Postsecondary Education (FIPSE) and the STAR program (Service Through the Applicaton of Research). Unfortunately, funding to support such a comprehensive effort did not materialize from three of the four proposed sources. Only the STAR program, which supported the management and evaluation components of the project, issued funds for the continuation of the project (STAR Grant 76-9065) which became Phase I of the FCBAP, "The Mangement and Evaluation of the Florida Competency-based Articulation Project."

With the severe curtailment of resources to conduct the project, project goals were re-examined and modified. The Project Executive Committee decided that only general education should be investigated as a basis for articulation and that the number of participating institutions should be allowed to diminish in order to narrow the scope of the project. The institutions interested in competency-based general education included: MDCC, BCC, FSU, FAMU, UNF and FIU. One institution (FIU) dropped from the project before the second workshop in December. Six faculty members from each institution either volunteered or were designated by their deans to participate in the project and to form a campus team with a coordinator to lead each team's activities. A more complete treatment of events leading up to Phase II and the management structure is described in the Final Report Phase I: Management and Evaluation of the Florida Competency-based Articulation Project, STAR 76-9065.

Problem Statment; Phase II

The problems addressed in Phase II can be viewed from two perspectives: first the larger and broader issues related to competency-based articulation; and secondly, those issues, more narrow in scope, which concerned Phase II

directly. From the broader perspective, competency-based articulation addresses problems germane to the articulation process itself: namely, equal access of students to upper division programs at universities from both resident lower divisions and community colleges; equating educational experience among lower division programs at universities, community colleges, correspondence schools, non-traditional colleges and life experiences; and as a means of establishing common standards of student achievement among the many diverse lower division programs in community colleges and universities throughout the state.

The specific problems which Phase II of the project addressed were identification of competency statements and their assessment in general education. They may be elaborated as follows:

1. The Phenomenon. How is competence defined? What is competence in general education? How can it be described in terms of discrete abilities? Can a group of faculty representing the broad range of arts and science disciplines from both community colleges and universities come to an agreement on the essential competencies of general education? How are they validated? Who is the ultimate authority in deciding what the competencies should be? How can the statements of abilities be structured and ordered so that they are meaningful and comprehensible? Can they serve as structure on which to build a curriculum? What is the relationship between a competency (process) and the academic subject matter (content) with which students learn and demonstrate competencies?

2. Assessment. How is the extent to which students possess the desired capability measured and evaluated? Is there a relationship between the development of these capabilities and the nature of the assessment techniques? Are new skills required by faculty to administer and evaluate

competency assessments? Could competency assessments be employed on a large scale?

3. Competency-based education as an instructional system. If the phenomenon of competence can be described and assessed, can an educational system be based on the demonstration of competencies for degrees or credits? What are the implications of such a system for students, faculty and society? Can it serve as a vehicle to improve the quality of education? What would be the curricular relationship between the traditional academic disciplines (a content structure) and the development of competencies (a process structure)?

4. Implications of CBE for Articulation. Can competency-based articulation serve as an effective solution for addressing the wider problems of equal access, equating educational experience and establishing common standards among lower division programs? What programmatic forms or outcomes would result from efforts to implement competency-based articulation? --- A centrally administered fourteenth grade assessment program in essential competencies? A comprehensive competency assessment program developed and administered by lower division programs on a local basis? A competency-based admissions test administered at the upper division? A consortium of representatives from locally developed competency-based educational programs who share in new knowledge and techniques about CBE? Or perhaps the establishment of a Faculty Development and Assessment Center at one of the institutions to serve as a statewide clearing house, consulting resource and research facility?

Furthermore, what are the policies that would be required to regulate the flow of students from lower division to upper division when articulation is based on the demonstration of competency? Would new recordkeeping procedures be required to monitor student progress? Would an interinstitu-

tional body be formed to regulate the establishing of essential competencies, their assessment and performance standards for certification?

5. Faculty development. How can skills in competency identification and validation be acquired? How can skills in competency assessment be acquired? How can faculty grow to value such skills as vital for the performance of their jobs in addition to the continued mastery of their disciplines? How can faculty learn to evaluate competence statements and assessments? Finally, how can they be brought to envision how a competency-based educational system could operate in order to reduce fears of change or experimentation?

Project goals

These specific issues led to the identification of the following goals for Phase II. By the end of Phase II, the project was to have:

- Identified outcomes of general education in terms of competencies and refined this listing within the project resources;
- formulated and administered experimental assessments of some competencies at the home institutions and evaluated the results;
- formed conclusions about the concept of competency-based education as it has been applied during this project;
- formed recommendations and observations about the potential of competency-based general education as a vehicle for improving articulation between and among community colleges and universities; and
- conducted and evaluated the feasibility of this inter-institutional faculty development process.

Theoretical bases for the project

Theory of Competency-based Articulation

In this project, Competence was defined as the idiosyncratic integration of knowledge, skills, and attitudes required for effective performance in

designated societal roles. A competency, then, was considered a discrete element of competence such as an ability, a specific skill, a specified knowledge area or possibly a personality trait. Therefore, the principle of competency-based articulation refers to the movement of students from lower division programs to upper division programs on the basis of required levels of proficiency in essential competencies rather than solely on the basis of the number, levels or kinds of courses and credits accumulated. In a competency-based articulation system, the competencies, assessment procedures and performance standards are cooperatively established and regulated by the faculty of both the lower and upper division educational programs involved in the transfer process. Finally, while it is recognized that students may achieve essential competencies in the present system of courses and credits, one cannot be certain without a valid assessment procedure.

An important assumption in competency-based education is that the skills or capabilities comprising competence are developmental or hierarchical in nature.[a] This means that students acquire competencies by first mastering lower level specific skills and then integrating them to form ever more complex skills throughout the span of a four year baccalaureate education. The culminating capacities or capabilities which are based on the integration of a coherant array of subskills are labeled generic competencies. The figure on the following page represents a basic hierarchical arrangement of specific skills underlying a generic competency. The figure is not meant to connote a temporal or necessarily sequential approach to the development of competencies, but only to indicate the relationship of lower order to higher order skills and knowledge.

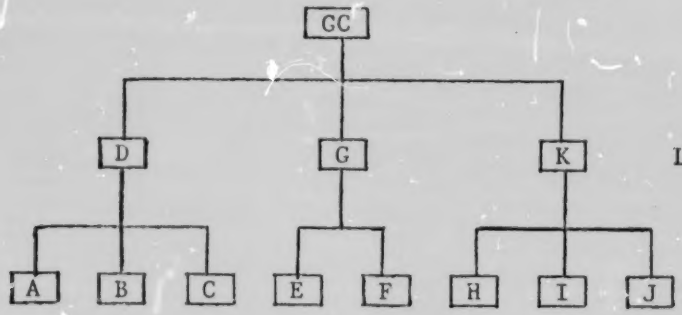
[a] Note: Important cognitive developmental hierarchies relevant to CBE may be those proposed by Gagne, Bloom, Piaget and Rusubel.

TABLE 1

DEVELOPMENTAL LEVELS IN THREE ESSENTIAL COMPETENCIES

Competency: A graduate will be able to: Level	A Receive information from written materials.	B Send information using written materials.	C Define a problem and impose form and structure on its elements drawing upon models derived from a variety of disciplines.
Level V	Interpret an article in a professional journal evaluate its validity and generalizability using supporting evidence.	Generate a written product in specialized content area that logically and and clearly presents ones own ideas, thoughts and feelings.	Interpret problems from specialized data; generate a new problem and impose structure on its elements; and formulate ones own perceptions of an ideal state of affairs.
Level IV	Using a text from a specialized content area, identify cause-effect relationships; recognize problem-solution strategies; draw inferences and conclusions; and recognize supporting details and main ideas.	Given circumstances set by an author, apply the general skills of level III to a specialized content area using the appropriate style and manner of notation.	Define a problem using the lanuage of a specialized content area; and identify a problem and its elements from another author's work in a specialized content area.
Level III	Using a paragraph from basic texts in the natural sciences, social sciences or humanities, recognize an authors use of tone, language, characterization, point of view and theme;identify cause-effect relationships; recognize authors problem and suggested solution; and draw inferences, conclusions and recognize supporting details and main ideas.	Organize ones own ideas into coherant patterns; paraphrase lessons from basic texts in Natural Science, Social Sciences and Humanities; document an authors ideas using an acceptable manual of style; incorporate own ideas with another's ideas into a unified coherent theme differentiating own ideas from others; and critically analyze imaginative or factual writing.	Isolate a specific problem from its contextual factors or related problems; identify "symptoms" that indicate the existence of specific problem or event, and formulate a concept of an ideal state of affairs and describe its elements.
Level II	Based on factual or expository writing, analyze an authors argument and distinguish between acceptable, unfair or falacious reasoning or argumentation.	Write a 500 word essay providing information about one central idea with supporting details with no more than 2% error in spelling and grammar usage; paraphase a short story; and develop a theme with introduction, main idea, development and conclusion.	Distinguish problem from symptom. Identify characteristics of a real and an ideal state of affairs in another author's writing; and discriminates between causes and effects
Level I	Recognize the main idea in a 100 word paragraph and state it orally or in writing; recognize supporting details (who, when, where, why, what); provide a literal interpretation of an author's message and follow a plot in short story.	Write a unified coherent paragraph using complete coherent sentences with a minimum of 15% error in spelling usage and grammar; and paraphrase short articles or long paragraphs.	Define a problem in terms of a need, frustrated goal directed activity, an hypothesis to be tested; an imperfect gestalt or an error in formal logic; and identify essential steps in problem solving processes.

Figure 1: A Hierarchical Arrangement of Subskills of a Generic Competency



Generic Competency

Level II Specific Skills

Level I Specific Skills

Applying these principles to competency-based articulation, transfer occurs when students are able to demonstrate at least a minimum level of proficiency at an agreed upon stage or level of development within essential generic competencies. Examples of how generic competencies as identified in the present project may be treated developmentally is presented in Table 1[b] on the following page in which two competencies are taken from the Effective Communications area and one from the Problem Solving area. (See Appendix I for the complete list of essential competencies identified in the project.) In these examples, the use of a five level hierarchy is strictly arbitrary. Alverno College in Wisconsin, for example, employs six levels to describe levels of competency development in their program.

Using this paradigm to explain how competency-based articulation might work in actual operation, an interinstitutional group of faculty members may decide that before students were permitted to transfer to the upper division, they would be required to achieve a mean proficiency rating of at least three on a five point criterion scale on tests designed to measure skills at Level III on the competency, "Send information using

[b] The content of this table is suggestive only and was developed with the advice and consultation of Marian Baskinski and Robert Rubanowice, FSU.

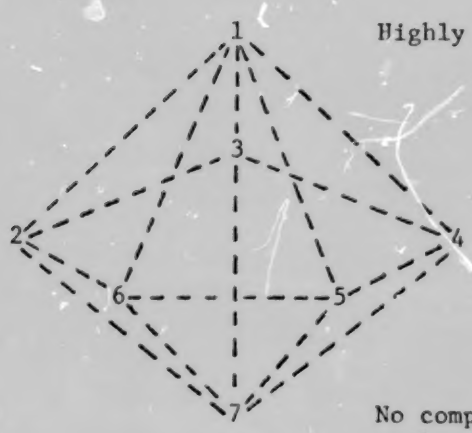
written materials." At this level of development, students would have mastered basic writing skills and would now be ready to apply them to meet the demands of specialized education in their chosen major field at the upper division level.

Assessment Theory

Two theories of competence assessment were investigated in the present project, one developed by the American College Testing Program and the other by Educational Testing Service. The model advanced by ACT perceives proficiency in competence performance as a continuous phenomenon, ranging from no competence to high competence. Hence, the rating scales are continuous and integral in nature employing a five point continuum. One extremity of the continuum represents a high degree of competency and the other connotes no competence with stepwise increments in between. Raters attempt to match a student's performance to one of the descriptions of performance at each point along the five point continuum. (See Appendix II for examples of rating criteria developed by ACT.)

In the case of ETS ratings, competence performance was perceived in terms of seven discrete categories in which the first category represented a very high degree of performance and the seventh category represented a very low performance, but categories 2-6 did not exist as a continuum, but merely as qualitatively different responses between these extreme poles. Thus a 2 rating may represent no higher degree of mastery than a 6 rating. The middle categories represent different aspects of partial mastery with no element particularly indicating a higher level of mastery over another. Figure II on the following page presents the ETS model of competence performance as suggested by Jonathan Warren. An example of rating scales developed by ETS is located in Appendix III.

Figure 2



Highly competent

Qualitatively different partial competences

No competence

An assumption in the project was that in order for faculty to make informed judgments about the competencies, their assessments and the applicability of using competence as a basis for articulation, they should develop skills in identifying essential competencies and determining whether a given test is a valid measure of an essential competency. Therefore, the major work of the project was to help faculty become familiar with the language and concepts of competency-based education and to develop their proficiences in certain appropriate skills. The means by which the project was able to introduce these concepts and skills in palatable ways to faculty members from the arts and sciences may be one of the most significant outcomes of the project.

THE PROJECT METHOD

Faculty Development Assumptions

Before beginning the implementation of workshop activities, several important assumptions were made about the level of attainment of critical skills and attitudes toward the project and toward competency-based education (CBE) in general.

1. Few project faculty will possess sufficient prior knowledge of the theory and practice of competency-based education or related assessment practices.

In order to address this assumption, the project staff organized lectures, submitted hand-outs, and obtained expert consultants to present basic terminology and concepts of competency-based education. Their content included methods of competence identification, criteria for evaluating sample competency statements, sample assessments, and criteria for evaluating assessments.

2. Attitudes toward project purposes would be mixed.

At the inception of the project, some faculty were committed to CBE as a method of pedagogy leading to the ultimate improvement of public education, while others were not. Some sought to be critical watchdogs to insure that the project would not lead to ventures that were not in the best interests of faculty or their institutions. Unfortunately, some became involved mainly because of external pressures from a dean. Though attitudes toward CBE and competence assessments were mixed at the outset, enough faculty shared the common goals of working together to solve transfer problems so that the project goals could be attained. By the end of the project, there was an observable shift by the group toward accepting, at least in principle, some aspects of competency-based education.

3. Some hands-on experience would be required before attitudinal change would occur.

For faculty to fully grasp the implications of a competency-based educational system, some practical experience beyond theory and the highy abstract process of identifying competencies would be warranted. Although it might have been desirable to have them actually develop and teach toward certain competencies, the short amount of time and limited funding would not support such comprehensive curriculum development. Having faculty identify and actually assess competencies was viewed as a way to provide faculty some practical experience in implementing a competency-based program. Through this activity, important issues surface. Furthermore, CBE becomes meaningful and its inherent difficulty becomes exceedingly apparent when faculty must clarify in their own minds what is meant when they say a college graduate should be able to solve problems "effectively" while taking into account the level of complexity of the problem in the test, the conditions under which the problem must be solved, the criteria used to rate the student's work and the kinds of educational experiences a student has had to develop the capacity.

4. Faculty would perceive some risk in this project on assessing student competence.

The project created a relatively safe milieux in which faculty could test their assumptions about CBE and insure that they increased their knowledge of it. It was reasoned that risk or perceived risk is minimized when faculty have control over the phenomenon they are investigating and are rewarded for trying something new. Faculty had control over the products of the project, did not have to engage either their colleagues or their administration, and were not required to disrupt the daily operation of their

institutions. In retrospect, the faculty generally agree that they had an interesting, intellectually stimulating task, additional money, travel, and professional fellowship they could not otherwise have had.

5. A common purpose evolves from shared experiences.

Considering the variety of experiences and purposes of faculty entering this project, it seemed imperative that all develop a common experience base. In this regard the project was designed so that faculty would physically work together on common tasks and share experiences so as to provide a common point of departure. Through the project activities faculty were able to move from five separate institutional groups to more of a unified project faculty. At this point it is important to note that at the last plenary workshop, faculty rated the interinstitutional shared activity as the most beneficial aspect of their participation in the project.

The Project Process

Activities and Strategies

An overall plan was developed for the project which would serve as structure and guide for organizing and integrating the project activities. The central issues are listed below. Each issue became the focal point for a workshop and accordingly there were seven workshops conducted in the project. The locations of the workshops are listed parenthetically.

1. What are baccalaureate outcomes? (Bahia Mar, Ft. Lauderdale)
2. What is competence? (Miami)
3. How is competence assessed? (Tallahassee)
4. Selection of pilot assessments. (Jacksonville)
5. Implementation of assessments. (local campuses)
6. Evaluation of assessments. (Orlando)
7. Recommendations and conclusions. (Tallahassee)

Pre-planning

Three aspects of project planning proved most significant - the duality of project management, limited resources, and the convening of faculty from a variety of institutuions to approach a common tark. The Project Executive Committee determined that the project staff should include a person from a State University and a person from a community college. It was felt that the goals of the project would be better met if both community college and university viewpoints were represented in the planning and decision-making process of the project. Their decision led to the appointment of two co-directors: a faculty member from Miami-Dade Community College-North, and another from Florida State University. It soon became apparent that their respective experiences in higher education (community college and university) and professional viewpoints (humanist and scientist) were different. Yet there was a complementarity that enhanced the planning and managing of activities, even though these differences did not always make managing the project easy. Yet it did enable them to keep each other's constituencies in mind in planning.

Limited resources for this project proved to be another important consideration - although less difficult to handle than the others. The project goals initially formulated in an original proposal requesting five times as much money as actually granted had to be re-examined. As a result both the goals and activities were considerably. Even the revised goals could not have been achieved without the strong commitment of some of the institutions involved. Several contributed released time for faculty, secretarial support, duplicating of project materials, long distance phone calls, etc.

The final aspect of planning that became critical was the fact that this was an interinstitutional project with faculty widely separated geographically from each other. The entire project process was affected by this fact. The

staff had to determine tasks which were absolutely essential and had to be done by the faculty as a whole in a workshop setting, as opposed to those which could be done by working through means of correspondence. For example, discussing the concept of competency had to be accomplished by faculty working together at one time and place, while the rating and prioritizing of competency statements could be done through questionnaires (DELPHI) sent to individual faculty. Tasks performed by the various groups were as follows:

1. Plenary Session

   Brainstorming plausible baccalaureate outcomes

   Listening to presentations about competence and its assessments

   Revising issues and questions about project goals and processes

2. Interinstitutional Groups At Workshops

   Revising competency statements

   Reviewing validity of assessments

3. Campus Coordinators

   Selecting assessments for pilot package

   Revising faculty ratings to questionnaire

   Making recommendations about future projects

   Organizing test administration procedures

4. Campus Teams

   Rating assessments for face validity

   Editing and revising competency statements

   Recommending assessment packages

   Proposing future projects

5. Individual Faculty

   Filling out questionnaires

Administering assessments

Rating student products

Recommending articulation strategies

The above activities do not cover all project tasks, but they do illustrate the many combinations of people and tasks necessary to accomplish the goals of an interinstitutional project such as this one. It also illustrates the fact that a great deal more was accomplished outside of workshops than in them, although the workshops provided the organizing events and enhanced motivation to make the between-workshop activities productive.

Project Activities

By June of 1977, proposals for funding of Phase II of the project had been submitted to F.I.P.S.E. (HEW) and to the Florida Department of Education. Even though the fate of the proposals was still unknown, an initial workshop was scheduled to be paid out of existing funds from STAR 76-9065. Feeling that it would be unwise to delay the workshop indefinitely, project staff planned and held the first workshop on June 2 and 3 in Fort Lauderdale, Florida. With the help of two consultants from Alverno College faculty, were introduced to competency based education as a total college system in the liberal arts. The consultants also shared some competence assessments and the concept of using assessment as a learning process, not necessarily as screening or evaluation processes.

The major outcome of this workshop for the project, beyond the obvious fact that it brought faculty together for the first time, was the development of lists of competency statements by interinstitutional, interdisciplinary groups of faculty. Faculty were asked to brainstorm in response to the question "what are the knowledges, skills and attitudes which a college graduate in Florida should have?" These lists became the raw material from

which subsequent drafts of competencies were derived. At the completion of the project the faculty had completed work on "Working Draft IV" (see Appendix I).

The lists also became a part of the interim work by faculty between the first and the second workshop. Using a Delphi procedure, the faculty were asked to rate the many competencies as "essential," "should know," and "nice to know," They did this twice, evolving ten competence categories in the process. While many faculty found this a very limiting technique for deriving essential competencies, the Delphi procedures technique offered a way of coming to some degree of consensus so that the project would not risk becoming bogged down in endless debate about the subtleties in describing competencies. Inspite of the limitation of DELPHI procedures, the first draft provided a concept-base for further revising and editing.

After some delays in obtaining release of appropriations, the project was funded jointly by the Board of Regents through their STAR (Service Through the Application of Research) program and by the Division of Community Colleges of the Department of Education of Florida. With these resources, the second workshop was held on October 20-21 in Miami. Consultants for this workshop were Howard Russell and George Klemp of the Institute for Competence Assessment in Boston, Massachusetts. At this workshop, two campuses had just formed their campus teams, one of which was unable to send more than half of its members. Attendance was a continual problem in an interinstitutional project. Usually, at least one member of a team from each campus was missing at every workshop. However, the problem of turnover (i.e. faculty dropping out and others adding to teams) was reduced almost completely after funding became a reality.

The consultants from McBer Corporation took the results of the Delphi process and asked faculty to extend their thinking about competence beyond typical academic definitions. They differentiated between minimal competence and excellence, between observed or manifest competence and casual competence, and between cognitive competence and affective competence. They also made an important distinction among competence assessments regarding quality. Some assessment techniques could be used to assess minimum levels of competence while others could be used to assess excellence. In effect, they were asking faculty to make finer distinctions among competence assessments by encouraging faculty to think in terms of which test is best for what use. They shared a number of assessments which faculty were asked to take home and evaluate for possible use in this project. Finally, they worked with faculty teams to begin to develop their own competence assessments. Further development of these assessments was done at the home campuses.

For the project staff, a major outcome of this second workshop was the team-building among campus coordinators. Campus coordinators were given a job description which identified their role in the larger picture of this project. They were given responsibilities for monitoring the homework of the respective campus teams. While project directors would meet with the campus teams from time to time, the coordinators had the responsibility for seeing that the work of the team was accomplished.

For the third workshop on December 1 and 2 in Tallahassee, Dr. Aubrey Forrest, director of the College Outcome Measures Project of American College Testing Program, and Dr. Jonathan Warren of Educational Testing Service, Berkeley, presented competence assessments that had been developed in their respective projects, as well as the theory of assessment underlying each instrument and rating criteria. Faculty responded well to the way ACT used one test item for rating several competencies and they liked the cleverness

of the ETS items - but voiced much concern about the validity and reliability of these as yet unproven instruments. Nevertheless, with emphasis in both tests on using faculty judgment to rate student work, faculty were generally favorably disposed toward giving these tests a try.

The other major outcome of this workshop was a return to the competency statements. Some faculty were dissatisfied with the statements and the overlap among them and so began a process of collapsing and refining that continued throughout the project.

This workshop could be viewed as a turning point for the project. It marked the end of the information giving and the beginning of the implementation period of the project. Faculty left this workshop with the task of reviewing the assessments that had been presented and recommending to their campus coordinators those assessments they wanted as part of the pilot test. It was also a turning point in that many of the issues and concerns of the faculty surfaced. A large number of visitors attended this workshop to inquire about the nature of the project. There is no question that many of their concerns affected faculty. What ensued was a healthy reexamination of project goals and a solidification of project faculty. From December on, the workshops and the work of the project centered on project participants.

With their faculties' recommendations in hand, the campus coordinators assembled in Jacksonville on February 9 and 10. The coordinators received Draft II of the competencies and again reviewed them. Much further refinement occurred as a result of this small group having uninterrupted time to examine them in depth. Draft III of the competencies was developed after this session.

Campus coordinators also brought with them about ten assessments developed by project faculty. Coordinators eventually chose eight assessment activities from among those developed by ACT, ETS, and project faculty from

FAMU. There were two from ACT, three from ETS, and three developed by project faculty.

The project staff had the task of assembling these tests in a test battery, complete with rating scales and instructions for administering them. Faculty had to set up appropriate equipment, arrange facilities, and identify students for administering the tests. The five institutions were asked to administer and rate each activity to 30 students. This proved fairly difficult for most institutions. One campus faculty team threw up its hands and said "no" to the task altogether while another issued a letter of protest. Yet, project faculty had a chance to see how these assessments work in actual practice.

The fifth workshop brought all faculty together again on April 20 and 21 in Orlando. This was definitely the most productive workshop of the project. Most of the project faculty were present with no visitors or consultants. The workshop had as its primary objective the creation of the major project products and recommendations. Faculty re-rated tests in interinstitutional groups and made judgments about the validity of those tests. They raised issues in competence identification, made recommendations on the use of such tests for articulation, and aired grievances. They returned to the original project goals and recommitted themselves to them.

On returning to their campuses, faculty were asked to develop an institutional plan for the continuance of this project. Not surprisingly, campus coordinators received a fairly diverse set of directions for each institution. Yet, a careful look at each plan reveals some of the differences in the institutions that participated in this project. At one institution, they are now ready to examine what others have done in competency based education; at another, they are ready to "really" attack refinement of

the competencies; and at yet another they are ready to develop an assessment center for the competency program already being implemented there.

Given the range of experience in this project, it was gratifying that the campus coordinators, in a meeting in Tallahassee on May 15, were able to confirm the results of faculty questionnaires from the last workshop as well as to outline the next steps they would like to see for the project. In fact, the overall tone of this final workshop was very positive and constructive.

This then was a second major outcome of the project, as first attempt nationwide to bring together faculty from both community colleges and universities to engage in a common task of identifying competencies and evaluating assessments for plausible use in the articulation process. Hopefully, not only the faculty will have benefited from the project, but ultimately their institutions and students as well.

In the process, the faculty were required to consider common educational goals and processes in ways many had not thought about them before.

PROJECT OUTCOMES

Intended Outcomes

1. A draft set of competencies will be drafted reflecting the desired outcomes of general education and refined to extent time and resources would allow.

A set of competencies was generated by first engaging in a brainstorming session to establish an initial concept base from which to prioritize and refine statements. Following the brainstorming session, a two pass Delphi procedure was conducted to allow some eighty faculty to rate and cluster competencies. Each project faculty member was asked to have three colleagues at their home campuses also rate statements to provide some degree of internal validity. From the Delphi procedures, the first working draft of competencies was generated which subsequently underwent three revisions. Working Draft IV is presented in Appendix I.

At the final plenary workshop held in Orlando, the Faculty were asked to rate statements about their attitudes toward the competencies on a Likert-type questionnaire (from 1=Strongly Agree, to 5=Strongly Disagree). The results of their responses to the questionnaire are presented in Table 2 on the following pages.

One can note from the table that the faculty are still not yet satisfied with the statements of competency. Their highest agreement was on the statement (#80), that the competencies required more development and clarification, and that many more statements would be required to describe the abilities a graduate should possess (#58). There was also a wide difference of opinion about whether the statements are suitable for describing skills on which to base articulation (#50), m=2.90, SD 1.15. Many of the means to the statements were between 2.00 and 2.50 which suggests that while faculty were lukewarm to the competency statements, with caution, they still

TABLE 2

Faculty Attitudes Toward FCBAP Competency Statements

Items[a]	m	σ
80. The present statement of competency (Working Draft III) requires further development and clarification.	1.71	.93
18. The competency statements are able to serve as an organizing principle of the development of a coherant array of subskills.	2.10	.97
33. Prospective employers should be consulted during this project so that the competencies reflect the basis for the development of employable skills.	2.19	1.09
58. Many more statements, in addition to the ones we now have in Working Draft III, are required to describe the abilities that a colllege graduate should possess.	2.33	1.49
15. The competencies identified are capable of being acquired in the framework of existing courses.	2.38	1.25
64. If you were a graduating college senior and possessed the competencies described in Working Draft III, you would feel confident that you possessed the qualities of an educated person.	2.38	1.21
20. The competencies described in Working Draft III can be used as useful starting points from which to generate your own institutional competencies.	2.43	1.37
27. Significant renovations in curriculum would be required to produce the competencies stated in Working Draft III.	2.43	1.14
31. The competency statements appear to be useful for describing the desired learning outcomes for both the associate arts degree and the baccalaureate degree.	2.43	1.09
57. The future career of an individual should influence the kind and level of competencies he should be required to attain.	2.43	1.18
60. The competency statements are useful for helping you to plan the objectives of the course you teach.	2.52	1.10

TABLE 2 (cont.)

Item[a]	m	σ
72. The competencies identified by this project are universal competencies that apply to every institutuion of Higher Education.	2.52	1.26
8. For the most part, the behavior described by our competency statements are capable of being assessed.	2.57	1.33
38. The competency statements are useful for describing how the skills and knowledge acquired by students in your class contribute to the overall development of competency in students.	2.57	.95
50. The competency statements are suitable for describing skills on which to base the articulation between lower and upper divisions.	2.90	1.15

[a] Item numbers indicate the order in which they appear on the Project Evaluation Questionnaire.

could be used for identifying subskills (#18), for describing the desired outcomes of AA and BA degrees (#31), and for starting points from which to generate individual institutional competencies (#20). A final significant note is that the faculty felt only mildly positive that the competencies are capable of being assessed (#8), m=2.57, SD=1.33, but the large variance indicates opinion varied widely on this issue.

2. The faculty administered experimental assessments and evaluated the results.

As mentioned before, the conscientiousness with which faculty administered the instruments varied among the institutions. Some administered over 240 assessments (8 activities X 30 students) while a few others administered hardly any feeling the task was too great even to begin. Nevertheless, a pool of test items, large enough to insure variability and anonymity, was obtained. At the last plenary workshop in Orlando, the faculty were introduced to the concepts of content validity and construct validity as applied to competency testing. Following the presentation, the faculty were divided into four groups of five and one group of four (one faculty member from each institution with the exception of UNF). The first group evaluated "Slowdown" (ACT), the second "Future Shock," the third "Norman Rockwell" (FCBAP), the fourth, "Woodburning" and "Mortality Tables" (FCBAP), and the fifth group "Creative Endeavor", "Roman Conquest" and "Earth's Rotation" (all ETS). (See Appendices II, III, and IV for examples of these tests.)

Each group rated three samples of behavior selected at random from the total pool of samples collected from the five institutions without collaboration among the raters. After the first three samples were rated by faculty, the groups entered into a discussion comparing observations and interpretations of the rating criteria. Following collaboration, the

groups again rated three samples of behavior drawn at random from the pool of student responses for each activity. Following the competency performance ratings, each group completed the Competency Test Evaluation Form for the competency activity they scored.

Variances among the ratings and intraclass correlations were derived for the ACT and FCBAP tests since the rating scales were integral and continuous. However, for the ETS tests, percentage agreements with respect to the modal frequency ratings were employed as measures of dispersion since the rating categories were ordinal and discrete.[c]

Tables 3, 4, 5 and 6 on the following pages summarize the findings from the paper.

The results of the analyses (Table 3) indicate that variances among the ratings for the ACT test were from 0 to 1.2 on a five point scale. In the case of "Slowdown," the variances among ratings may have been reduced because of the narrow range of scores at the low end. Undoubtedly, this activity was much too difficult for a majority of undergraduates. (A copy of the stimulus materials and ratings criteria for "Slowdown" appears in Appendix II.) The variances among the ratings for the FCBAP tests ranged from 0 to 3.7 on a five-point scale. The ranges of scores on these items were spread more evenly throughout the five point continuum than the ACT items. (The stimulus materials and rating criteria for "Woodburning" are also located in Appendix IV.)

The percentage of agreement among the raters with respect to the modal frequency of the ETS rating categories is presented in Table 4. The ETS

[c] Note: A full technical treatment of this aspect of the study is presented in a paper entitled "The evaluation of competency performance: an interinstitutional perspective" which was represented at the statewide conference for institutional researchers held in Orlando on June 14, 1978. A copy of the paper can be obtained from Gary Peterson, Florida State University.

TABLE 3
Variances Among Ratings
Before and After Collaboration

Activities 1 - 6 ACT and FCBAP

ACT Activity	Competency	Before Collaboration samples 1	2	3	range* of ratings	After Collaboration samples 1	2	3	range* of ratings
1. Slowdown (raters = 5)	Communication	1.0	1.2	.5	3-5	.3	.5	1.2	2-5
	Problem Solving	.3	0	0	4-5	0	.2	.2	4-5
	Individual & Social Beh.	0	0	.2	4-5	.2	.3	.5	3-5
	Value & Self Knowledge	0	0	.3	4-5	.7	.2	.8	3-5
2. Future Shock (raters = 5)	Communication	.5	.3	.7	1-3	.2	.7	0	2-5
	Value & Self Knowledge	1.0	.8	.8	1-3	.8	1.2	.8	3-5
	Individual & Social Beh.	.7	.3	1.2	1-3	.2	.7	.7	2-5
FCBAP									
3. Norman Rockwell (raters = 4)	Communication	.3	1.0	.9	1-5	1.0	1.0	.9	1-5
	Arts & Aesthetics	.3	.3	.9	3-5	.3	1.7	1.7	1-5
	History Awareness	.7	.3	3.7	1-5	.3	.9	0	1-5
	Value & Self Knowledge	3.7	1.0	.9	1-5	.9	1.3	0	1-5
4. Woodburning (raters = 4)	Problem Solving (a)	.9	.7	0	2-5	1.6	.3	.9	1-5
	Problem Solving (b)	.9	.3	0	3-5	0	0	0	3-5
5. Mortality Tables (raters = 4)	Understanding and Applying Science	0	0	0	2-4	0	0	0	4-4

* 1 = highest level of performance
3 = medium level of performance
5 = lowest level of performance

TABLE 4
Percent Agreement Among Judges
With Respect to Model Frequency of
Rating Categories

Activities 6 - 8, ETS

		Before Collaboration Samples			After Collaboration Samples		
		1	2	3	1	2	3
6. Creative Endeavor (raters = 5)							
	Arts & Aesthetics	60%	60%	80%	40%	60%	80%
	Critical Thought	60%	60%	80%	40%	60%	60%
7. Roman Conquest (raters = 5)							
	Critical Thought	60%	80%	40%	80%	80%	60%
8. Earth's Rotation (raters = 5)							
	Understanding and Applying Science	40%	60%	40%	40%	40%	60%

TABLE 5

Intraclass Correlations by Activity

Test Maker	Activity	before collaboration	after collaboration
ACT			
	Slowdown df 4, 14	.72	.76
	Future Shock df 4, 11	.61	.68
FCBAP			
	Norman Rockwell df 3, 14	.61	.85
	Woodburning df 3, 5	.91	.86
	Mortality Table df 3, 2	1.0	1.0

format for rating criteria called for the judges to match the observed behavior with the behavior described in the seven categories of plausible responses. The percent agreement for five judges ranged from 40% to 80% both before and after collaboration. (The stimulus materials and rating criteria for "Earth's Rotation" are presented in Appendix III.) Since the assumptions of neither non parametric nor parametric statistics could be met in this analysis, no tests of significance were applied to determine whether the differences before and after collaboration could have occurred by chance alone. However, an "eyeball" inspection suggests that ratings before and after collaboration were very similar.

The results of the analysis (Table 5) using the intraclass correlations to estimate reliabilities among the raters indicated that correlations ranged from .61 to 1.0 before collaboration to .68 to 1.0 after. In some instances, such as "Slowdown", the range of scores on the test was so narrow that strength of the coefficient would be appreciably suppressed since there was littel variability among the responses. With the possible exception of "Norman Rockwell", differences in strengths of correlations before and after collaboration appear to be very similar. Thus, the major source of variation among the raters was probably due to the raters own unique interpretation of rating criteria rather than to perceived differences in quality of competency performance among the members of the inter-institutional teams of raters.

The results of the Competency Test Evaluation Questionnaire, Table 6 on the following page, indicated that only in isolated incidences, did the faculty rate the tests highly in terms of construct validity (i.e. the test measures the competency skill accurately). The only activities to gain a modicum of approval were "Future Shock", by ACT, a video taped recording of a nine minute speech prepared by students on nontraditional marriages; the

TABLE 6
Faculty Evaluation of Competency Tests Using the
Competency Test Evaluation Form

Key
1 = Strongly Agree
2 = Agree
3 = Neutral
4 = Disagree
5 = Strongly Disagree

Questions \ Competency Activity	ACT		FCBAP			ETS		
	Slow-down (n=5)	Future Shock (n=5)	Norman Rockwell (n=4)	Wood-burning (n=4)	Mortality Table (n=4)	Creative Endeavor (n=5)	Roman Conquest (n=5)	Earth's Rotation (n=5)
1. Construct validity								
a) (competency a)[d]	3.8	2.4	4.0	3.8	3.5	2.4	1.6	2.5
b) (competency b)	3.6	2.4	3.8			2.2		
c) (competency c)	4.4	2.0	1.5					
d) (competency d)	4.4		3.0					
2. Content validity								
a) (competency a)	4.0	2.0	3.0	3.3	3.3	2.6	1.6	2.5
b) (competency b)	3.6	2.0	3.5			2.2		
c) (competency c)	4.4	2.0	1.5					
d) (competency d)	4.0		2.5					
3. The activity was easy to administer	2.2	4.4	3.0	2.0	1.75	3.0	3.0	2.7
4. The competencies were easy to rate	4.4	3.0	3.0	4.8	2.0	2.8	2.6	4.8
5. The rating criteria were sufficiently clear & allowed for easy scoring	4.0	3.6	4.5	4.8	2.0	2.0	2.0	5.0

[d] See key for competencies after the Table.

TABLE 6 (cont.)

	Slow-down	Future Shock	Norman Rockwell	Wood-burning	Mortality Table	Creative Endeavor	Roman Conquest	Earth's Rotation
6. You would find this item useful in your classroom	4.6	3.0	4.0	4.3	4.8	3.2	3.0	4.4
7. You could compose other competency activities like it yourself	3.6	2.3	2.6	2.7	3.3	4.0	3.6	4.2
8. Students enjoyed responding to this activity	3.6	2.6	3.0	3.0	3.0	3.0	3.0	3.7
9. You would recommend using this activity to award credit for learning	4.8	3.8	4.3	4.8	4.8	3.0	2.6	3.8
10. You would use this activity for evaluating the outcomes of a general education program	4.8	3.6	4.0	4.8	4.8	3.2	2.6	3.8
11. Particular scores on these competencies could be established as minimum criteria on which to allow a student passage from lower division to upper division	4.2	3.0	3.0	4.8	4.5	3.8	2.6	3.8

[3] See key for competencies on the following page

Competencies Assessed
In the Eight
Respective Activities

1. Slowdown (ACT-COMP)

   (a) Communications
   (b) Valuing & Self Kowledge
   (c) Institutional and Social Behavior
   (d) Problem Solving

2. Future Shock (ACT-COMP)

   (a) Valuing & Self Knowledge
   (b) Individual and Social Behavior
   (c) Communications

3. Norman Rockwell (FCBAP)

   (a) Art
   (b) Valuing & Self Knowledge
   (c) Communications
   (d) Historical Awareness

4. Woodburning (FCBAP)

   (a) Problem Solving

5. Mortality Table (FCBAP)

   (a) Understanding and Applying Science

6. Creative Endeavor (ETS)

   (a) Arts and Aesthetics
   (b) Critical Thought

7. Roman Conquest (ETS)

   (a) Critical Thought

8. Earth's Rotation (ETS)

   (a) Understanding and Applying Science

Communications competency in "Norman Rockwell" where students recognized forms and interpreted meanings of five Norman Rockwell paintings; and "Roman Conquest," an exercise in Critical Thought, where students identified inconsistencies in a recording of history about the rise of the Roman Empire. All other competency assessments were rated low in construct validity by the faculty, as indicators of the competencies deemed important by this interinstitutional group. These same three competency activities were also rated high for content validity (i.e. the suhject matter was appropriate) while all others were rated low, except for "Creative Endeavor" where students were asked to demonstrate how form in art enables one to appreciate a short story as well as a piece of music.

Additional results of the questionnaire suggest that some of the tests were difficult to administer, especially "Future Shock" requiring a film projector and a film in high demand for rentals; that the competencies were fairly difficult to rate (except for Mortality Table, where the rating criteria were strictly empirical in nature and required no rater judgment); that there was generally a high degree of ambiguity in using the rating criteria; and that the faculty would not find these tests particularly useful in their courses. Furthermore, as a group, the faculty did not feel confident they could develop similar tests like these themselves, nor would they recommend using these tests to award credit for learning. They would also not use them to evaluate the outcomes of a general educational program, nor would they recommend their use in articulation. In short, the faculty, by and large, rejected the tests for use in instruction, evaluation, certification or articulation.

The Project Evaluation Questionnaire contained a number of items concerning their attitudes in general toward the tests. The results of the portion of the questionnaire concerning the tests is presented in Table 7

TABLE 7

Faculty Attitudes Toward Competence Assessment Instruments

Item[a]		m	σ
6.	Students who were rated high on competency tests seem to be competent individuals in class.	1.81	1.14
11.	The items seem too time consuming to administer and score relative to the information gotten from them.	2.05	1.36
9.	Students who scored high on the competency tests show promise of becoming successful individuals in adult roles in society.	2.14	1.32
24.	Competence assessment instruments could be used for curriculum evaluation.	2.43	1.05
7.	Students seemed to like the test.	2.62	1.09
69.	You would expect a student who earned a score on a test to earn the same score on a retest 6 months later.	2.62	1.25
40.	The developing of a pool of test items to assess competency would be difficult to assemble.	2.95	1.33
17.	The items selected for pilot testing appeared at first glance to measure the competencies.	3.00	1.27
61.	You would expect a student to earn a similar score on a competency item 15 years later.	3.00	1.38
21.	The students understood the items used.	3.10	1.02
2.	ACT items seemed to assess competency well.	3.43	1.22
45.	The items developed by project faculty seemed to assess competency well.	3.48	1.05
12.	ETS items seemd to assess competency well.	3.62	1.09
43.	The items selected to assess competencies are valid indicators of competencies stated in Working Draft III.	3.86	1.28
47.	My colleagues would probably feel that these tests were valid and useful instruments.	3.90	.81

[a]Item numbers indicate the order in which they appeared on the Project Evaluation Questionnaire.

on the following page. These results confirm the results of the Competency Evaluation Questionnaire presented in the previous table. The rather large variances suggest that there was a wide range of opinion among the faculty about the tests. An informal observation was that faculty who had more experience with the tests seemed to be more tolerant and hopeful towards the test than those with lesser experience.[e] Causality is not meant to be inferred here. It could well be that this relationship merely represents an underlying open mind about the entire project enterprise. More will be said about the results of the evaluation of the competency tests in the discussion and conclusion section of this report.

3. Faculty will have formed conclusions about the concept of competency-based education as it has been applied during this project.

Attitudes about competency-based education were assessed in the Project Evaluation Questionnaire administered at the end of the plenary workshop in Orlando. The results of faculty responses to items concerning competency-based education are presented in Table 8 on the following page. The results of the questionnaire suggest that faculty participating in the project accept CBE as worthwhile but very much do not want its implementation and control in the hands of the state legislature. For example, the faculty generally agree that they would like to see their departments identify and assess competencies (#54), that it can be a means for improving the quality of education (#78), that it's an idea whose time has come (#56), and that it's not more trouble than it's worth (#67). On the other hand, faculty are much more reserved about (and even rejected) the notion of having the state Legislature require universities (#13) or community colleges (#79) to identify and

[e] Both the Miami-Dade and FAMU faculty groups participated in project sponsored by ACT to field test and score competency tests on a comprehensive basis. Thus, these groups became more familiar with the ACT test than others.

TABLE 8

Faculty Attitudes About Competency-based Education

Item[a]	m	σ
54. You would like to see your department identify and assess competencies.	1.76	1.02
78. One way of ultimately improving the quality of education is to first determine the nature of skills students are developing as they go through the curriculum.	1.76	.43
51. The notion of using competency of program development is still a foreign concept to your colleagues.	1.90	.87
56. I feel the CBE is an idea whose "time has come".	2.19	1.14
4. Other schools don't seem to think about CBE the way we do at my institutuion.	2.43	.95
30. The BOR should secure special funds to identify and assess competencies at the member institutions.	2.43	1.33
14. You feel you could be a vocal advocate for competency-based education at your institution.	2.48	1.22
63. Competence assessment instruments could be used for individual certification of academic accomplishment.	2.62	1.46
79. You would advocate the adoption of a policy by the legislature requiring individual community colleges in Florida to identify and assess competencies.	3.10	1.38
13. You would advocate the adoption of a policy by the legislature requiring individual senior colleges to identify and assess competencies.	3.14	1.67
73. CBE makes more sense from the standpoint of the student's future economic survivability than it does from the standpoint of their total educational development.	3.29	1.20
67. CBE is more trouble than it is worth.	3.71	1.03
37. Individuals could be awarded a college degree solely on the basis of having demonstrated a minimum level of performance in essential competencies.	4.33	.94

[a] Item numbers indicate the order in which they appeared on the Project Evaluation Questionnaire.

assess competencies, or that individuals could be awarded degrees soley on the basis of demonstrating minimum levels of performance in essential competencies (#37). One curious response is that faculty see competency-based education most beneficial to students (71% agreement) but only 19% indicated it was most beneficial to faculty. Thus faculty see CBE serving the best interests of students more than faculty. (See Appendix VI on Faculty Issues in Competency Identification.)

4. Faculty will have formed recommendations and observations about the use of CBE as a vehicle for improving articulation among community colleges and universities.

As indicated previously, the faculty definitely did not feel that articulation arrangements should be based on performance on the kinds of assessments that were pilot tested in the present project. In the project evaluation questionnaire with a five point Likert-type scale (1=Strongly Agree, 5=Strongly Disagree), faculty agreed that they would like the project to continue (m=2.05, SD=.95), disagreed with the statement that the project should be discontinued (m=3.90, SD=.97), and that if given a chance, they would work on interinstitutional projects in the future (m=2.00, SD=.82). The results of the data suggest that faculty feel that much more work is required to clarify the competencies and to develop assessments before articulation based on the demonstration of competence should become a reality.

5. The project will have investigated a faculty development process for introducing competency-based education.

As indicated earlier, the ability to render informed judgments about the applicability of competency based education to address problems in articulation requires a thorough mastery of fundamental concepts in competency-based education. The project approached this by having faculty actually

identify competencies and select and administer assessments on an interinstitutuional basis perhaps similar to the procedures interinstitutional faculty groups would be required to implement should competency-based articulation become a reality. How well then did faculty master some of the skills necessary to implement competency-based articulation programs? This issue was addressed by having faculty evaluate their level of mastery on the basis of self estimates. A number of items on the Project Evaluation Questionnaire concerned the development of competency skills and are listed in Table 9 on the following page.

The results of the items concerning the effectiveness of the faculty development aspects of the project suggest that the project helped faculty become more informed about the nature of competency and how to assess it (#26), that they are able to compose test items to measure competency statements in areas related to their areas of expertise (#77), that their skills in evaluating competency statements improved as a result of the project (#25), that their skills in formulating competency statements improved as a result of the project (#52), and that their skills in competency assessment have improved as a result of the project (#74). However, responses were very mixed on their ability to determine whether a selected competency assessment procedure is a valid indicator of a given competency statment (#23), or whether they can now state the outcomes of their courses more clearly (#29), or whether they could lead other faculty in the development of competency identification and assessment skills (#42), even though they feel other faculty could learn these (competency) skills (#49). A final auspicious note is that regardless of the outcome of this project, they will continue to strive to identify competencies and assess them in their courses (#346). The results of the questionnaire suggest fairly convincingly that the faculty perceived that they acquired important knowledge and skills about com-

TABLE 9

The Development of Knowledge and Skills
Related to Competency-based Education

item[a]		m	σ
26.	The project has helped you to become more informed about the nature of competence and how to assess it.	1.95	.84
46.	Regardless of the outcome of this project, I will strive to identify and assess competencies in my courses.	2.05	.90
74.	You feel that your skills in competency assessment have improved as a result of this project.	2.05	.95
25.	You feel that your skills in evaluating competency statements have improved as a result of this project.	2.14	.94
77.	You are able to compose test items to measure the competency statements in areas related to your areas of expertise.	2.19	.85
49.	You feel that other faculty members at your institution could learn these (competency) skills.	2.24	.54
52.	You feel that your skill in formulating competency statements has improved as a result of this project.	2.29	.93
76.	You and your competency committee could replicate the procedures used in the project to identify and assess competency statements.	2.33	.84
36.	As a result of this project you can see more clearly how your courses contribute to the development of competency in students.	2.48	.85
42.	You would be able to lead faculty in the development of skills to identify and assess competency.	2.81	1.18
23.	You are able to determine whether a selected competency assessment procedure is a valid indicator of a given competency statement.	2.86	.94
29.	As a result of the project, you can now state the intended learning outcomes of your course more clearly.	3.05	1.13
35.	Most of your colleagues are presently well skilled in this project's area of interest.	3.71	1.24

[a] Item numbers indicate the order on which they appeared on the Project Evaluation Questionnaire.

petency-based education from the project.

However, attitudes about the use of this knowledge beyond their individual courses is equivocal. In items concerning the institutionalization of competency-based education, the faculty clearly perceived resistances and difficulties. Table 10 on the following page presents items concerning institutionalization of CBE. It appears that faculty perceive that if there are proponents of CBE it would be from upper level administrators while resistance would come from their colleagues. They also see that a high degree of cooperation among faculty would be required to implement CBE programs. These results suggest that if one wished for a groundswell of faculty enthusiasm to support CBE, one may go on wishing for some time. Many more projects like this one, supported by key educational leaders, are required to alter faculty attitudes in order to attempt the implementation of competency-based programs.

Unintended outcomes and related events

Murphy's Law may be paraphrased, if something unexpected can happen, it will. Phase II was not without its share of unanticipated or related events that had a bearing on the intended project outcomes. These "related events" were assessed by having the campus coordinators list three important contributing events that either had a significant influence on the attainment of project outcomes or had a potential influence on plausible future project endeavors. These events are described in Appendix 5 as the campus coordinators recorded them. However the essences of their comments are summarized below:

Boward Community College

1. Faculty have been stongly encouraged to participate in efforts to implement competency-based education principles. The English department has undertaken the task of stating objectives, defining minimum standards and constructing instructional modules for composition courses.

TABLE 10

Institutionalization of Competency-based Education

item[a]	m	σ
34. I feel that my institution should continue to investigate competency and the assessment of it.	1.67	.64
62. A higher degree of cooperation among faculty would be required to foster competency in students.	1.86	.64
55. Administrators, if they knew more about competency, would likely allocate funds to develop, administer and score the tests.	2.57	.90
28. The administrative process for adopting competencies and tests at your institution is easily identifiable.	3.33	1.25
66. Your colleagues at your respective institutions could adopt the competencies and assessments with little difficutly.	4.10	1.11
83. You would expect the most resistance to identifying and assessing competencies from		
a. Colleagues in your department (52%)		
b. Colleagues in your institutuion (62%)		
c. Board of Regents (0%)		
d. Community Colleges (5%)		
e. Senior Colleges (33%)		
85. Who do you feel would be most favorable towards the use of competencies and tests at your school?		
a. faculty members (29%)		
b. department heads (19%)		
c. deans (19%)		
d. upper echelon administrators (62%)		
87. Who do you feel would oppose the use of competencies and tests at your school?		
a. faculty members (86%)		
b. department heads (38%)		
c. deans (19%)		
d. upper echelon administrators (14%)		

[a]Item numbers indicate the order in which they appeared on the Project Evaluation Questionnaire.

2. Faculty members participating in FCBAP found the rating criteria of the pilot assessments too easy to "fudge."

3. Even though the faculty did not have as much time to devote to the project as they would have liked, they did begin to re-evaluate their own classroom procedures and standards. One faculty member expressed frustration that a competency he felt was essential for an individual to succeed in society did not appear on the final draft of competencies.

Miami-Dade Community College

1. In the fall of 1977, a Competence Assessment program was conducted in four courses which enabled faculty to gain experience in designing, administering and evaluating competence assessment instruments.

2. In the fall of 1977, Miami-Dade North initiated a Competency-based program in general education using many of the competencies identified in the FCBAP.

3. An attempt was made to evaluate the ACT/COMP battery in the Winter Term, 1978. Even though the responsibilities of administering these instruments were passed to another evaluator, faculty gained exposure to new methods of assessment.

Florida Agricultural and Mechanical University

1. Because of the project faculty's concomitant involvement in the ACT/COMP project, they became somewhat the "experts" in competence assessment for the FCBAP.

2. The faculty enjoyed writing their own items for the FCBAP pilot test and wished they had more time for this activity.

3. Involvement in both projects at the same time, while complementary, was exhausting.

4. One faculty member, not associated with the project, resisted using class time for the purpose of pilot testing FCBAP instruments.

Florida State University

1. The campus coordinator's time to participate in the project had to come from his own research time as determined by both the Dean of Arts and Sciences and the Vice President of Academic Affairs.

2. From discussions with colleges, both competency tests and content tests would be inadequate to assess a generic competency such as Problem Solving. Only in the context of a course, where an instructor could introduce many assessment tasks in a variety of circumstances, could competency be adequately evaluated.

3. The FSU team felt, although not unanimously, that the competencies generated from the DELPHI technique were meaningless to subject matter faculty; that the instruments pilot tested were unsatisfactory, even when cleverly done; and that time to administer the instruments was too time consuming relative to the quality of the results.

University of North Florida

1. A visit by one of the co-directors to UNF changed no minds about project goals although it did provide an opportunity for members of the project team to ventilate feelings and concerns.

2. With extreme discontent toward the project's competency statements, members of the team would not administer tests that were only tenuously related to them.

3. Lack of stability of team membership and apparent lack of widespread institutional commitment deterred faculty enthusiasm and attendance at the workshops.

The critical incidents as recorded by the project coordinators, most likely reflect the prevailing attitudes toward competency-based education at the local campuses. These attitudes varied from extreemly positive at one institution, in which the project faculty were engaged in implementing a competency-based program, to rather open defiance by some members at another. Seemingly, unless faculty or observers stayed with the project and dealt with their own fears and biases, they never surmounted a reacting-against phase to progress toward a more positive stage of genuine open-minded, critical inquiry. Fortunately, as the results of the investigation suggest, most faculty reached this more constructive phase by the close of the project.

DISCUSSION AND CONCLUSIONS

The inevitable question always arises from research projects, what does it all mean? The central issue this project addressed was to explore the feasibility of competency-based articulation. This issue was approached by having faculty actually engage in tasks related to its implementation. These included competency identification and validation, developing and selecting assessments, administering and scoring assessments, evaluating them for validity and determining their reliability. This feasibility study emphasized the simulation of tasks required to implement competency-based education rather than using more abstract methods of analysis. What then was learned from this "hands-on" approach?

The project

As mentioned earlier, the faculty began the project with very diverse attitudes toward the nature of the project goals and competency-based education in general. Several items were included in the Project Evaluation Questionnaire using a 5 point Likert-type scale (from 1=Strongly Agree to 5=Strongly Disagree) which addressed their attitudes about the project itself. Some of the more important findings were that: the faculty could not have made the progress they did without interacting with faculty from a variety of institutions (m=1.81, SD=.79); the project proved to them that inter-institutional efforts are worthwhile (m=1.95, SD=.58); and if given a chance to work on inter-institutional projects in the future, they would do so (m=2.00, SD=.82). This project has proven to faculty that inter-institutuional efforts are effective (m=1.95, SD=.84) and they would like to see the project continue (m=2.05, SD=.95). However, even though the faculty participating in the project generally felt positive toward it, support from administrators and colleagues at the home institutions was somewhat less:

central administrators were pleased with your participation in the project (m=2.14, SD=1.05); your department head was pleased with your participation (m=2.38, SD=1.00); and in explaining this project to your colleagues, they felt predominantly positive (m=3.71, SD=1.03).

These results indicate that the faculty participants tended to be more favorably disposed to project goals than were administrators and especially colleagues at their home institutions. Quite possibly there was an interaction effect between the processes employed in the project and kinds of faculty who volunteered to participate. Since most of the faculty were volunteers, the generalizability of the results of these project processes to other faculty groups must be taken with caution. Whether these same events and activities would produce similar results in non-volunteer populations is still a viable question. A subsequent project could involve replicating the procedures used in the present project to study their effects on non-volunteer populations.

Nevertheless, since a true experimental design was not used in the conduct of the project, one cannot conclude that these processes "caused" significant attitude changes among the participants. The project did, however, demonstrate that faculty from both community colleges and universities representing a variety of institutions, could work together to achieve common goals.

The competencies

Even though faculty felt the competencies from the study could serve as starting points for helping individual institutions to identify and validate their own and that they could serve as useful organizing principles for the generation of a coherent set of lower order subskills, they felt they required much more development before they could be viewed as accurately representing the desired outcomes of baccalaureate education from public institutions in

Florida. At the last plenary workshop, the faculty began to ask, after administering and scoring the assessments, what these statements really mean. They began to realize in very concrete terms the difficulties in describing essential skills graduates should possess in precise, comprehensible terms. As a result the faculty left the workshop very frustrated for not having identified a set of competency statements that reflected their standards. However, after a Delphi procedure and four working drafts, one wonders whether a faculty group would ever become satisfied with statements of competency or whether there ever would be a document that could be considered a "Final Draft" of competency statements. In fact, could there ever be a set of statements that would be considered the sine qua non of baccalaureate competencies? In this respect, some participants realized that competency statements will always undergo processes of refinement and clarification in an attempt to more accurately communicate the intended outcomes of educational programs as they now exist and as they undergo change.

An important subsequent project for faculty in Phase III would be to engage in the task of identifying an array of enabling subskills that underlie several of the statements generated in this project. This would serve the following purposes: first it would help to clarify the meaning of the statements themselves; second, it would help faculty grasp concretely the developmental nature of competencies; and third, it would provide a set of coherent statements from which to develop competence assessment instruments. From such statements, tests could be developed for diagnosing entry level skills for evaluating student progress in mastering the competencies and for determining whether students have achieved the desired levels of proficiency at the terminal points of their programs.

It is possible that the competencies may have been rejected in their

present form primarily because they were not fully understood. Would greater understanding and acceptance occur when faculty explore the developmental nature of the competencies and create measures to assess them? It seems unlikely, though, that generic statements of any kind would ever be accepted without knowing more about them and consequent implications for instruction.

The assessments

This faculty group by and large dismissed the assessment activities selected from among the ACT/COMP battery, the ETS competency tests and the FCBAP item pool as in valid measures of the competencies that were designated by this group as essential baccalaureate competencies. The only assessment to receive consistently favorable ratings for both content and construct validity was on effective oral communication, in which students gave a nine-minute prepared speech, recorded on video tape, in response to a segment of the film, Future Shock on forms of non-traditional marriages.

However, before concluding that the competence assessments pilot tested in this project were inappropriate and inadequate, it would be well to mention that one important issue emerged that would bear upon the acceptance of any competency assessment by a faculty group. This group, in the amount of time they had to work at the project and the amount of experience in competency testing, never came to closure on the issue of determining the nature of the content that should be used to demonstrate the competencies. Many faculty seriously questioned the use of a magazine article or a film to supply the content base for an assessment activity. Some felt that the competencies should be assessed using academic content from the traditional subject matter disciplines, while others felt strongly that the content should be supplied from sources individuals would likely encounter in

everyday life. Seemingly, this issue must be resolved before faculty could agree to adopted published instruments to measure competencies or to administer ones they themselves develop.

Most likely, the resolution of this issue lies in arriving at a definition of competence itself and in determining the role educational institutions have in helping students master its elements. To many faculty, they may have perceived competence more in terms of academic competence (ETS model) than in terms of generic life coping skills. Some faculty members remained uncertain about whether traditional academic content is a means for developing essential life-coping skills or whether it is an end in itself. In a competency-based educational system focusing on the development of life coping skills, content is viewed as a means rather than an end. It means that a physics instructor would be concerned about how well students communicate in writing and how well students are aware of their own value structures in the process of mastering the laws of classical mechanics. Perhaps it is the confusion about the interrelationship of content and process that partially underlies the rejection of both their own competency statements and competence assessments as well.

A final issue, that perhaps pales against issues of validity, concerns the reliability of the assessments used in the study. Intraclass correlations of the magnitude of .60 to .85 (See Table 5), when five raters evaluate twelve performances, are not very impressive, especially if these assessments would be used to certify competencies in individuals. Intraclass correlations are determined by coupling each individual rating against a mean rating of the jury. This procedure results in higher order correlations than if each of the ratings were coupled with respect to each other as in a Pearson Product Moment Correlation. Therefore, returning to the

feasibility issue, given the level of consistency among the raters in this study, fairly lengthy tests (longer than the 12 items used in this study) would be required to accurately determine whether students possessed a required level of proficiency on a competency. In order to improve inter-rater reliability, either the rating criteria should be perfected or extensive training experiences for raters should be offered. Both of these considerations would ultimately translate into additional instructional costs to conduct competency-based educational programs. However, with improved rating criteria and faculty experienced with these kinds of performance assessments, costs to develop, administer and score competence assessments could be reduced somewhat. It would be well to recognize now that increased quality assurance, which is one of the major underlying impetuses for competency-based education, will most likely require additional resources unless the educational processes by which competencies are achieved become more efficient.[f]

Future directions

At the final workshop held at FAMU for the campus coordinators, the faculty decided that the next step should be to again reduce the scope of the project by exploring only two of the competency areas identified in Working Draft IV, Effective Communication and Problem Solving. One of the goals would be to identify an array of subskills subsumed in the statements in these competency areas and to formulate stages or levels of development. Secondly, they wish to develop and implement assessments based on these levels of development in their courses and thirdly, they would hope to see

[f] Note: See paper written by Peterson, G. W. and Stakenas, R. G. "Performance based Education Systems for Higher Education: Challenge, Bone, or Fad," in Procedings of Society for General Systems Research, 1978, Southeastern meeting for a treatment of how this might be accomplished.

if they could teach toward the attainment of these competencies. On the basis of these investigations, a clearer perspective will be acquired in terms of how competency-based articulation might work from the standpoints of assessment and the teaching/learning process. The faculty felt it must be determined how competencies are assessed and taught in systematic ways before they could or should be certified in students. Thus Phase III would be a coordinated inter-institutional research and development effort with the products being a battery of competence assessments, tested in courses, that can be used to assess a student's level of development in Effective Communication and Problem Solving.

While it is appropriate for faculty to conduct basic research in competence identification, their assessments and implications for the teaching/learning process, a parallel thrust must also occur in Phase III in the area of organizational development in which central administrators and department chairpersons could explore some of the following topics: formulating policies and investigating information systems required to manage a competency-based articulation system; resolving central vs. local control over competencies, assessments and standards; financing of program development activities; financing the administration and scoring of assessments; developing of record keeping systems; establishing faculty development and assessment centers to provide faculty assistance in implementing competency programs; safeguarding the rights of students and faculty in an educational system that requires the assessments, criteria and standards to become public; etc. Without parallel faculty and administrative efforts it is doubtful whether competency-based articulation would ever become a reality. All of these proposed efforts are of course based on the assumption that competency-based articulation shows promise for addressing vital concerns in Florida post secondary education and that it may well result in improving

the quality of educational experiences for students and faculty alike. The product of the investigation of these issues would be a blueprint for how a pilot competency-based articualtion system would be managed and financed. Both faculty and administrator constituencies would review each other's efforts before attempting to attain public reaction.

Phase IV, then would involve the actual implementation of a pilot competency-based articulation system in Florida among selected community colleges and universities under the aegis of the Articulation Coordinating Committee. It would include the collective contributions of faculty, administrators and students. Until Phase IV is complete, the feasibility of competency-based articulation will be an open issue. Results of this project imply that it would not be feasible to simply select some assessments from off the shelf and implement a competency-based articulation program. This would amount to no more than wishful thinking. Hopefully, administrative and financial support will be forthcoming to allow this faculty group an opportunity to complete their challenging and worthwhile mission to implement quality competency-based articulation programs in Florida.

Conclusion

In looking back on this project, several important outcomes emerge.

1. Faculty became excited and worked well together after sharing the common experience of rating students on the project assessments. Given the fact that faculty came from very different kinds of institutions, a common background had to be developed. Perhaps the process could have been accelerated by administering the tests as an initial activity and using this common experience as a base for learning about competency. This would be a more inductive, discovery mode than the deductive approach

used in this study. Yet another approach would be to enable faculty to actually practice CBE by teaching toward competencies in their respective classes. Through this method the actual integration of process and outcome would be achieved. However, the level of funding and extent of institutional commitments to support this latter endeavor would be much more than the amount awarded for the present project.

2. Faculty had been involved in setting goals for the project, but they had never had a chance to develop personal or team objectives for meeting them. Some concerted efforts at team building on each campus and generally working locally with administrators to better match campus goals with project goals would undoubtedly have aided faculty in developing "ownership" and in securing the administrative support they require on home campuses. Many saw no need for the home campus to commit itself in any way to project goals. This is surely not what the project staff had in mind. Perhaps more effort should have been made to coordinate project goals with institutional goals. Eventual institutionalization of project goals depends on this step. Before the initiation of Phase III, a thorough examination of the goals of the institutions involved in this project should be conducted so that the project's goal's become a means for helping institutions realize their own goals.

3. If it is agreed that faculty are more likely to reach project goals by mutual and supportive collaboration, the workshops were instrumental in fostering the conditions to bring this about. More "show and tell" time was desired as well as more time to work and plan (dream) together. The workshops could also have been used more effectively to confront biases, fears and differences that impeded progress. The resolving of many troublesome issues seemed to take too long.

Recommendations

A major outcome of this project was the demonstration of a method for removing some of the barriers and sterotypes that separate community college and university faculty which could pave the way for the implementation of articulated competency-based programs. Some possible future steps which could continue to foster this development are:

1. Consortium projects in geographical regions which address the areas of faculty sensitivity in articulation such as competencies in general education, assessment practices, and standards for assessment.
2. Regional and representative group meetings to discuss articulation policy questions, especially:
   - entrance skills tests and levels of performance which determine possible referral to developmental opportunities;
   - exit skills prerequisite for transfer (in general education or in majors).
3. Performance assessment centers with joint staffing by community college and university faculty at different campuses throughout the state.
4. Faculty groups working together to develop test banks and item pools for pre- and post-testing of students.
5. Faculty exchanges between community colleges and universities, e.g. leave arrangements, joint assignments etc. This would allow faculty to experience unique problems and perspectives in the respective environments.
6. A faculty newsletter on curriculum issues. Encourage direct dialogue therein on "name-calling" subjects between community colleges and universities. This could be a good sounding board for articulation issues. It would seem an inexpensive (especially if only issued quarterly) project for the Florida Department of Education to sponsor under the aegis of the Articulation Coordinating Committee.

7. An Articulation Center or Clearinghouse to conduct research on articulation questions, to maintain and disseminate up-to-date information on articulation (especially data on transfer students in Florida, on competence levels of students in high schools, legal issues concerning transfers, etc.) and to sponsor activities such as 1-6 (above) as well as other faculty development activities in relation to competency-based articulation.
8. The Articulation Coordinating Committee (ACC) could sponsor the development and implementation of these suggested support services and events to foster change. This means the ACC would assume an added emphasis on research and development in the articulation process.

Successful articulation based on competence would seem to depend on a delicate balance between institutional autonomy and interinstitutional cooperation. A project like this one can serve as a model for achieving such a balance. Probably the most significant finding of this project was that faculty could achieve this balance by focusing on a common task, a meaningful superordinate goal, the identification and assessment of eesential competencies.

THE

APPENDICES

I. Essential Competencies: Working Draft IV

II. ACT Assessments and Rating Criteria: An Example

III. ETS Assessments and Rating Criteria

IV. FCBAP Assessments and Rating Criteria

V. Campus Coordinators Comments: Critical Incidences

VI. Faculty Issues in Competency Identification

ADDENDUM: Evaluation Committee Report

APPENDIX I

The Competencies

Working Draft IV

Working Draft IV

BACCALAUREATE COMPETENCIES

Florida Competency Assessment Project

I. Effective Communication

II. Problem Solving

III. Valuing and Self Knowledge

IV. Critical Thought

V. Historical Awareness

VI. Individual and Social Behavior

VII. Understanding and Applying Science

VIII. Arts and Aesthetics

What is Postsecondary Education?

A university education should give a person "a clear conscious view of his own opinions and judgments, a truth in developing them, an eloquence in expressing them, and a force in urging them. It teaches him to see things as they are, to go right to the point, to disentangle the skein of thought, to detect what is sophistical, and to disregard what is irrelevant. It prepares him to fill any post with credit and to master a subject with facility. [It shows him how] "to accommodate himself to others, how to throw himself into their state of mind, how to bring before them his own, how to influence them, how to come to an understanding with them, how to bear with them".

John Henry Cardinal Newman
The Idea of a University, 1852

AREA I: EFFECTIVE COMMUNICATION

Rationale

Viewing communication from the standpoint of a transaction, as senders, effective communicators are able to formulate their thoughts, ideas and feelings in an organized, clear and concise manner calling upon the proper use of verbal and non-verbal symbols for expression. In contemporary culture, senders must also be able to use a variety of media to communicate their inner experience and function within the constraints of the media. As receivers, effective communicators are able to interpret meanings of others, receiving audible and visual symbols through a variety of media, and are able to relate back to senders an understanding of the latter's ideas, opinions and feelings. Finally, effective communicators are able to use thier capacities for effective transaction in a variety of social contexts and for a variety of purposes such as motivating, persuading, emphathizing informing and managing.

Generic competencies

Specifically, a graduate from a public university in Florida will be able to:

1. Send information via oral and non-verbal presentations through a variety of media;
2. Receive information via oral and non-verbal stimuli through a variety of media;
3. Send information using written materials;
4. Receive information from written materials;
5. Send information using numeric and graphic representations;
6. Receive information from numeric and graphic representations.

AREA II: PROBLEM SOLVING

Rationale

A problem may be defined as a discrepancy between the real and the ideal, or perhaps in terms of a need, a frustrated goal directed activity, an hypothesis to be tested, or an imperfect gestalt where the relationship between parts and wholes is inconsistent. Systematic and logical problem solving processes result in removing such decrepancies or anomalies and lead toward the gaining of new knowledge about oneself and the world. Therefore, effective problem solvers are able to analyze a problem into its component elements, recombine these to form alternatives, reach a solution, put it into action and evaluate the ensuing results. Effective problem solvers are sufficiently flexible so as to be able to implement this process in a variety of contexts and situations.

Generic competencies

Specifically, a student with a baccalaureate degree from a public univeristy in Florida is able to:

1. Define a problem and impose form and structure on its elements drawing upon models derived from a variety of disciplines;
2. Diagnose plausible causes of a problem;
3. Propose alternative solutions and assess their probable effects;
4. Select a solution and attempt to carry it out;
5. Evaluate the results of an attempted solution;
6. Infer the applicability of a solution to related problems.

AREA III: VALUING AND SELF KNOWLEDGE

Rationale

In the process of conducting the affairs of daily living, we make decisions and formulate goals based on knowledge of the world and our own abilities, interests and values. Hence, knowing how values are formed and clarified in ourselves and others becomes an essential capability for effective living. Therefore, formal education can enable individuals to develop capacities for identifying their own personal values and the personal values of others. Furthermore, educational processes engender the ability to determine how personal values influence important life decisions and how values translate into behavior which impacts on others. Therefore, self knowledge enables and thus requires individuals to assume responsibility for personal actions.

Generic competencies

Specifically, a baccalaureate graduate from a public unversity in Florida will be able to:

1. Identify the major values and issues usually faced in daily adult life in one's own and other cultures;
2. Discriminate between one's own set of personal values and those of one's own culture and other cultures;
3. Assess a set of values for internal consistency in self and others;
4. Identify major influences on the development of values in individuals and society;
5. Formulate a rationale for adopting values;
6. Infer personal values from behavior;
7. Incorporate knowledge of personal and social values in personal decision-making or problem solving processes;
8. Evaluate one's own performance in any worthy activity with respect to a legitimate external standard.

AREA IV: CRITICAL THOUGHT

Rationale

We are continually faced with decisions - which school to attend, which public official to vote for, what job to take, which house to buy. In each case critical thought is called for. A critical thinker is able to extract universal truths from particulars and in turn infer particulars from general laws and does not mistake opinion for knowledge, facts for abstractions, or means for ends. Critical thinkers are able to wage an argument by perceiving an issue from more than one stance. They are able to think logically even when instruments for observation are not precise; but yet at the same time they are aware of the limitations of the premises on which conclusions are based. Finally, individuals who think critically are able to integrate both objective and subjective criteria in rendering judgements while assuming responsibility for their own subjective responses.

Generic competencies

Specifically, individuals with a baccalaureate degree from a public university in Florida are are able to:

1. Differentiate rational from irrational responses to issues;
2. Demonstrate deductive and inductive modes of thought;
3. State a problem in terms of an issue;
4. Wage an argument from two opposing points of view to a stated issue;
5. Evaluate an argument in terms of validity of assumptions and logic;
6. Differentiate among observation, inference and judgement;
7. Differentiate between association and cause/effect;
8. Describe reality in terms of a variety of perspectives (e.g. rational-irrational, logical-illogical, scientific-humanist, verbal-quantitative);
9. Apply rules of evidence in the determination of truth (e.g. statistical probability, logic, jurisprudence, or revelation).

AREA V: HISTORICAL AWARENESS

Rationale

Through a study of history, individuals gain a perspective on the complexity and pluralism of the human record, including an awareness that perennial human questions and concerns have been treated differently in various periods and cultures in the past. Individuals are able to comprehend the dialectic between forces for change and forces perpetuating continuity in the human story and demonstrate an ability to evaluate historical phenomena from three vantage points, namely, from the actors themselves, their contemporaries, and succeeding generations including their own. Finally, as a vital aspect of historiography, individuals are capable of discerning essential differences in viewing history-as-event and history-as-record in terms of methodologies of investigation and implicit and explicit bias.

Generic competencies

Specifically, a graduate from a public university in Florida will be able to:

1. Demonstrate the relationships among past, present and possible future events;

2. Trace the historical development of at least one culture different from one's own in terms of politics, enconomics, social organization, religion, world view, and values;

3. Interpret elements of an idea or its manifestation in terms of the culture in which it was produced;

4. Discern author bias in historical documentation.

AREA VI: INDIVIDUAL AND SOCIAL BEHAVIOR

Rationale

Social institutions such as government, economics, family, and religion provide the form and structure of culture and society. They serve man by providing a means with which to satisfy human needs as well as allowing a constructive outlet for the release of destructive impulses. Thus, one of the important aims of formal education is to train individuals to function within society's institutions and to assume responsibility as free men for their perpetuation and development. Some of the essential social capabilities required for functioning within our institutions are leadership, using power, and using compromise and consensus to achieve higher order purposes. Individuals should also understand how institutions both provide for and limit individual freedoms and how the inevitable tensions between self will and society's will are reconciled.

Generic competencies

Specifically, a graduate with a baccalaureate degree from a public univeristy in Florida will be able to:

1. Describe and anlyze individual and social behavior in light of a norm;

2. Describe the structural and functional relationships of important social institutions in culture (e.g. government, religion, family, economic, legal and occupational);

3. Demonstrate how principles of compromise and consensus are used to form laws, allocate resources for social maintenance or change;

4. Describe how individual and group behavior (including organizations and institutions) is modified and how individuals and groups influence each other;

5. Explain how supply and demand functions operate in the exchange of goods and services in society;

6. Describe how social institutions function as systems;

7. Describe methods by which human conflict is resolved and the consequences resulting from the method and resolution;

8. Demonstrate essential social skills (e.g. leadership, group participation, negotiation, compromise, etc.) within a variety of social contexts.

AREA VII: UNDERSTANDING AND APPLYING SCIENCE

Rationale

Science trains the mind to percieve precisely what exists rather than what should be or what is good or bad. Hence, science describes, analyzes and explains. Individuals using scientific methodologies effectively are able to judge a proposition true or false within the limitations of evidence and techniques of observation. They are able to use logic and mathematics as the media through which to pursue scientific argument. Furthermore, individuals competent in scientific thought, are able to discern the limits of the applicability of scientific methodiologies in terms of what is real, reoccuring and measurable. Finally, individuals are able to comprehend and apply the concept of the controlled experiment with which to validate knowledge.

Generic competencies

Specifically, within the general content areas of biology, chemistry, physics, mathematics, oceanography and other natural sciences, a baccalaureate graduate from a public univeristy in Florida will be able to:

1. Demonstate mastery of formal logic with respect to arithmetic, algebraic and statistical operations;

2. Relate the basic natural laws of science (e.g. gravitiation, genetics, energy transformation) to the understandings of important issues of the day including, health, energy, environment;

3. Apply sceintific methods and procedures in the solution of a problem and cite limitations of scientific proof (e.g. reliability and validity);

4. Demonstrate skill in a variety of observation and measurement techniques.

AREA VIII: ARTS AND AESTHETICS

Rationale

Works of art may be thought of keys to understanding the universals of human nature and, in turn, ourselves. The arts provide a means for expression of man's creative impulse and for more vividly understanding his world. Through a knowledge of art and the subjective creative process, individuals are able to perceive a variety of creative phenomena in their complex forms and structures. Persons versed in the arts possess a capacity for deriving joy from the beauty of the artistic product and its ability to clarify reality and thereby their own identities. Finally, the ability to appreciate works of art enables individuals to develop their own capacities for perceiving and valuing the beautiful and to acquire an understanding of the processes through which artists view and create impressions of the world.

Generic competencies

Specifically, a baccalaureate graduate from a public university in Florida will be able to:

1. Describe the elements that constitute the artistic activity product;
2. Recognize form in art;
3. Identify artistic phenomena of one's culture;
4. Develop a set of personal criteria for evaluating art form;
5. Discern quality in art (true to form or rules of form);
6. Value artistic endeavors as leisure activity;
7. Describe the nature of ones own experience resulting from a confrontation with a work of art.

APPENDIX II

An Example of

ACT Assessments

and

Rating Criteria

THE ECONOMY

There's no slowdown in sight

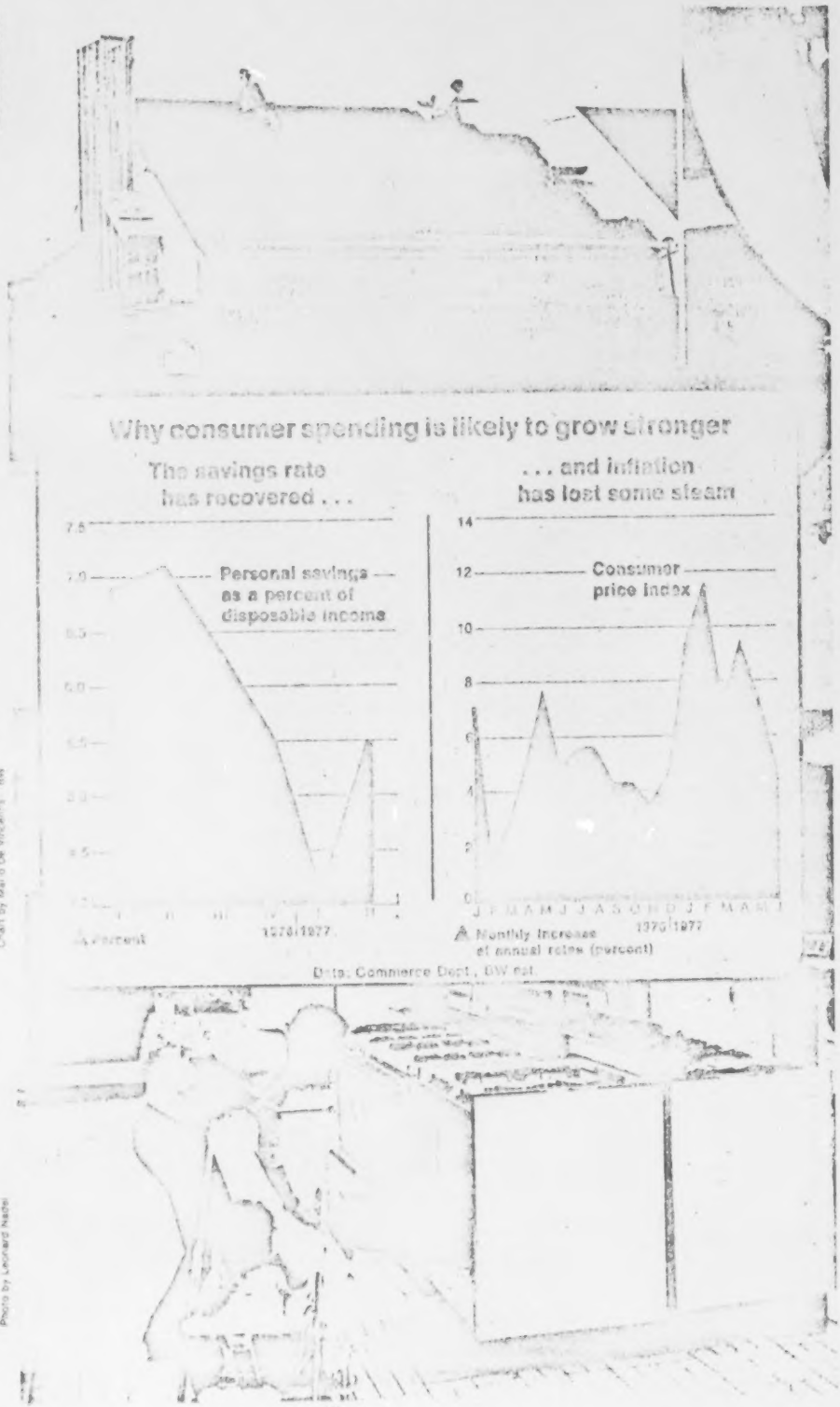
The torrid 7% growth rate of the first half may be nearly matched

Retail sales have been virtually flat for three months. Unemployment in June increased to 7.1%, from 6.9% in May. And the stock market has been hovering precariously close to its 17-month low. All of this has filled some economists and businessmen with apprehension over the economic outlook for the remainder of the year. But a careful weighing of the latest evidence this week indicates that a marked second-half economic slowdown is simply not in the cards. The U. S. economy over the next six months will fail to match the torrid 7% growth achieved in the first half of the year, but not by much.

Unlike the second half of 1976, when the real growth of the gross national product fell by nearly two-thirds from the 6.8% rate of the first six months, GNP this second half should increase by a solid 5½% to 6%, well above the historical trend of 4%. Reflecting on the concern of some forecasters over the breather that the economy took in late spring, an Administration economist says: "We're not getting a repetition of last year's six-month lull. We are simply seeing the hot first-half pace cool down to a more sustainable 5%-plus track."

Economy-watchers worrying over the near-term outlook have been focusing their attention on the consumer. Consumer spending clearly fueled much of the sharp increase in GNP in the first half of the year. Many analysts pointed to the first quarter's unusually low personal savings rate (the percentage of disposable income that consumers do not spend). The low rate—originally reported at 4.8% and revised downward this week to 4.1%—was a warning, they argued, that the consumer would be cutting back on spending to bring savings back to more normal levels. And the lackluster performance of retail sales over the past few months seemed to confirm these fears.

Expensive consumer. But just-released preliminary data by the Commerce Dept. show that the savings rate in the second quarter spurted to 5.5%. This


Why consumer spending is likely to grow stronger
The savings rate has recovered . . .
Personal savings as a percent of disposable income
Percent
1976/1977
. . . and inflation has lost some steam
Consumer price index
Monthly increase at annual rates (percent)
1976/1977
Data: Commerce Dept., BW est.
Chart by Mario De Vincentis
Photo by Leonard Nadel

means that consumers, by and large, have already made a major correction in their desired level of saving, and that further cutbacks in spending are unlikely. Says Donald Ratajczak of Georgia State University: "The rate of saving had to move up. It's best that it happened now. There won't be much of a correction left to be made."

Indeed, the consumer may have already bounced back into a more expansive spending mood. "Retail sales in late June and early July took a leap forward," says Otto Eckstein, president of Data Resources Inc., economic consultants. "With wage and salary income continuing to show strength, the consumer enters the second half with a strong momentum of purchasing power growth." And that momentum already seems to have been translated into surging auto sales. Detroit reported last week that the daily selling rate of U. S.-made cars spurted up by 15% in the first 10 days of July over the comparable period last year, almost double the selling rate in the last part of June.

Loosened purse strings: Housing, autos, and appliances will all probably benefit.

The near-term inflation outlook should also help put consumers into a spending frame of mind. The consumer price index for June, scheduled to be released late this week, is expected to show a 4.8% increase, at annual rates—down from the 7.3% rate in May. According to the Conference Board, consumer confidence in the economy in June showed a marked increase from the April level. The evidence of the past five years indicates that just as accelerating inflation causes consumers to tighten their belts, so moderating inflation makes them untie the purse strings. And indeed, the experts are looking for the increases in consumer prices to stay at or even below 5%, at least through the summer. Moreover, the $5.9 billion rise in Social Security benefits, effective July 1, and the $5.5 billion drop in withholding taxes, which started on June 1, will add to disposable income and thus generate an increase in spending.

'Sleeper of the year.' But even if—and it's a big if—consumer spending should taper off in the months ahead, government spending at all levels should more than take up the slack. Federal spending in the first half of this year ran under budget, and spending showed only a slight increase in real terms. But government spending in the second half should be a big plus for the economy. Economists at Morgan Guaranty Trust Co. call government spending "the sleeper of the year" in their own bright outlook for the economy. Defense spending should show strong gains over the next six months, they maintain, as the huge surge in defense contracts—averaging 29% above year-earlier levels—is translated into government purchases.

Likewise, spending by state and local governments should beef up the economy's second-half performance. The budgets of the states and localities turned to the plus side early in 1977 after years of red ink. By the second quarter, the Morgan economists estimate that, despite heavy spending, the surplus grew to $9 billion at an annual rate. Local financing so far this year has reached a near record of $23 billion. "Recent borrowings also support the expectation of stepped-up outlays," say the economists at Morgan. In addition, some $20 billion from President Carter's economic stimulus package—in the form of public works spending, public service employment, and revenue sharing—should begin flowing soon.

The wild card. Despite a slowdown in European economic growth (page 18), economists believe the U. S. economy may also get a boost from the sharp decline in the U. S. dollar, which hit a four-year low this week. "Foreign trade was a disaster in the first quarter," notes Data Resources' Eckstein. Exports increased by only 0.3%, while imports rose 20%, and the imbalance worsened in the second quarter. "But the decline in the dollar has restored American competitiveness," he says. "The U. S. trade deficit will improve."

The wild card in the economic deck in the months ahead, however, will be investment in plant and equipment. Since the beginning of the economic recovery, business P&E spending has consistently underrun the forecasts of economists. And forecasters have understandably become gun-shy. "We've seen conflicting reports on how strong the increase is, and the outlook is still murky," says Daniel H. Brill, Assistant Treasury Secretary for economic policy.

Nevertheless, Alan Greenspan, former chairman of the Council of Economic Advisers under President Ford, is encouraged by what he sees as a pickup in "long-lived" capital goods. "In the first part of the year," he notes, "spending on nonautomotive capital goods was increasing at a rate of less than 3%. Now we have industrial construction permits up substantially for May, coupled with a 1½% increase in production of equipment. This means that capital spending is moving closer to forecasts, and it should provide some further thrust to the recovery." ■

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ACTIVITY 1

Exhibit C

QUARTERLY CHANGE IN GNP

(in % based on 1972 dollars)

Year	Quarter	% Change
1973	1	9.5
	2	0.4
	3	1.7
	4	2.0
1974	1	-3.9
	2	-1.8
	3	-2.4
	4	-5.5
1975	1	-9.6
	2	6.4
	3	11.4
	4	3.0
1976	1	8.8
	2	5.1
	3	3.9
	4	1.2
1977	1	7.5
	2	6.4

(Adapted from *Time*, August 1, 1977)

ACTIVITY I

INSTRUCTIONS FOR QUESTIONS 10-15: Quickly read questions 10-15 before reading Exhibit B, "There's No Slowdown in Sight" and Exhibit C, "Quarterly Change in GNP," on pages 22-25. You will have thirty-four (34) minutes to read the questions and article and answer questions 10-15. During this time you should work only these questions. In responding, draw on all the knowledge and skills you have acquired from any source as well as the information in the article.

10. What information in the table (Exhibit C) supports or contradicts the article's interpretation of GNP?

a _____

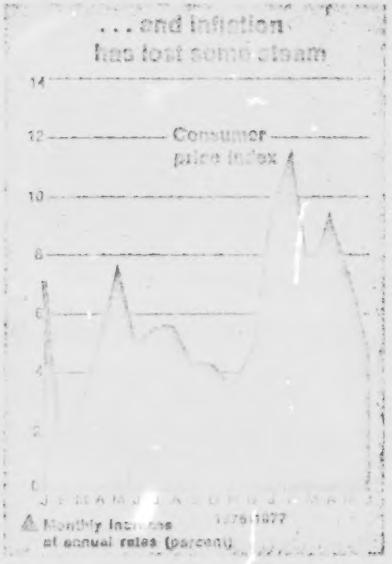
b _____

c _____

d _____

e _____

11. *Business Week's* estimate of the consumer price index in June 1977 was incorrect, as the monthly increase for June was at an annual rate of 7.4%. Correct the graph reprinted at the right to show the actual rate and explain how this might change the conclusions reached in the article.



_____

_____

_____

_____

_____

12. Describe in detail how you would determine the effect that savings rate has on consumer spending.

_____

_____

_____

_____

_____

Continue with questions 13-15 on page 21.

13. What factors may be overlooked by business persons who welcome increased government spending designed to boost a slow economy?

a. _____

b. _____

c. _____

d. _____

e. _____

14. Based on the article, what values influence how people use their money?

a. _____

b. _____

c. _____

d. _____

e. _____

15. What are some desirable and undesirable effects of consumers frequently buying new autos, appliances, and houses?

a. _____

b. _____

c. _____

d. _____

e. _____

Did you have enough time to complete this activity? _____ Yes _____ No

Activity 1

GENERAL GUIDELINES
COMMUNICATING

The student can receive information from numeric and graphic representations. The student should show an awareness of the specific task required, as well as location of relevant details. As evidence of this ability (at the standard selected from the five levels of proficiency below) the student:

(Record your judgment on line 1 of the student's computer card.)

Level 1

Question 10: Compares the GNP table to the interpretation of GNP in the article and raises 4 or more RELEVANT issues, such as:

Level 2 Compares the table and article information on GNP and raises 3 RELEVANT issues, such as:

Level 3 Compares the table and article information on GNP and raises 2 RELEVANT issues, such as:

Level 4 Compares the table and article information on GNP and raises 1 RELEVANT issue, such as:

Level 5 Suggests no relevant comparisons in interpretation of GNP.

SUPPORTS

--- the first half growth rate was about 7%
--- the rate for the first half of 1976 was about 6.8% (the table indicates 6.95%)
--- the table does indicate a two-thirds decline the last half of 1976

CONTRADICTS

--- there is no "historic trend of 4%" unless one counts declines as well as growth
--- no evidence is offered for why the GNP level will stay high and this prediction cannot be projected from the table
--- the first-half growth rate of 7% is no different than last year, or even the last half of 1975, so why is it called "torrid"?
--- the "lull" in the last half of 1976 was really more like a plunge
--- the table suggests the possibility that GNP growth tends to slow in the last part of the year

APPENDIX III

An Example of

ETS Assessments

and

Rating Criteria

ACTIVITY 8

CHANGE IN THE EARTH'S ROTATION

Suppose a method was proposed for producing energy that would also cause the earth's speed of rotation to slow, increasing the period of rotation from 24 to 26 hours. An Environmental Impact Report (EIR) must, of course, be filed.

What are some of the important questions that should be addressed in the EIR? You need not include every question you can think of and you need not answer the questions you raise. They should illustrate the kinds of possible effects that ought to be investigated before the project is approved.

ACTIVITY 8

SCORING CATEGORIES

Q412 Changes in the Earth's Rotation

Natural Science and Math
Awareness

Scoring categories are based on the relative number of three types of questions according to the following scheme.

Category	Description
1	Two or more Type A questions with the number of Type C questions equal to or less than the combined number of Type A and Type B questions.
2	One Type A question with the number of Type C questions equal to or less than the combined number of Type A and B questions. Or, two or more Type A questions with the number of Type C questions greater than the combined number of Type A and B.
3	One Type A question with the number of Type C questions greater than the combined number of Type A and B. Or, two or more Type B questions with no more Type C than Type B.
4	Two or more Type B questions with a greater number of Type C questions.
5	One Type B question with any number of Type C questions.
6	Any number of Type C questions; no A or B questions.
7	The response is incomprehensible or irrelevant.

This scheme is summarized in the table below.

Number of Questions of Each Type

Category	A	B	C
1	≥2		≤A+B
2	1		≤A+B
	≥2		>A+B
3	1		>A+B
	0	≥2	≤B
4	0	≥2	>B
5	0	1	any number
6	0	0	any number
7	Irrelevant or incomprehensible		

Type A questions are those related to an important environmental issue and that indicate knowledge of an effect that will occur (such as a decrease in the centrifugal force at the earth's surface) or knowledge that some effect is likely even though its precise nature is not known (such as the changes in heat flow produced by the longer days and nights having some unknown effect on ocean currents and weather conditions).

Examples:

Will the changed heating cycle of longer days and nights affect
- the life cycle of plants
- the polar ice caps
- ocean currents and therefore
  - climate
  - marine food cycles

Will climate or weather be changed in ways that will affect
- crop yields
- average rainfall or snowpack
- atmospheric pollution

Will biological or physiological cycles be changed in ways that will affect
- animal behavior
- health

Will the greater gravitational effect (due to reduced centrifugal force) influence
- atmospheric composition
- weather
- physiological processes
- health
- energy consumption

[Mention of gravitational effects may be a Type A or Type C question depending on what it indicates of the student's knowledge. Weight is determined by a combination of gravitational attraction and centrifugal force due to the earth's rotation, but common practice is to lump the two effects together in determining the numerical value of "gravitational" acceleration, g. So a response referring to the know change in "gravitational pull," or some similar term, would be classed as Type A. A response that asks that the unknown changes in gratitational pull be investigated would be Type C because those changes are known and don't need investigating, although their effects are not known. Similarly, a response that refers to a decrease in gravitational effects is Type C because it's wrong.]

Type B questions are related to important effects but are so general and lacking in elaboration that no judgment can be made that the student has more than the vaguest understanding of the possible effects.

Examples:

What will be the effects on
- climate
- weather
- agriculture
- food production
- plants and animals
- oceans
- atmosphere
- social behavior

Type C questions are any of the following kinds.

a. Comparatively trivial

Examples:

What will be the effect on
- clocks, calendars, time keeping
- length of school or work day
- leisure time activities
- life styles

b. Over-board

Examples:

Would catastrophic events occur?
Can man adapt?

c. Remote or unrelated to rotational change

Examples:

How long would a year be?
What would be the effect on
- earth-moon relationship
- earth's magnetic field
- tilt of precession of earth's axis
- earth's rotation around the sun
- solar system
- star patterns, galaxy

d. Unrelated to the environment

Examples:

Would the scheme be cost-effective? (economics)
Who would decide whether to do it or not? (politics)
How would the energy be stored, distributed, or used?

e. Questions that include errors of interpretation or understanding

Examples:

Will the gravitational pull we feel be any different? (See above.)
Would plants be able to live in the extra hours of light each year?
Will the increased temperature be of value? (Temperature overall may or may not increase, although the days may be warmer and the nights colder.)
Will the energy produced be enough to offset the energy used by longer nights? (Although nights will be longer, so will days, and the ratio of light to dark or day to night will not change.)
Would more sunlight increase food production? (Although food production might well be affected, the overall amount of sunlight will not be affected.)
Would summers (or winters) be longer? (They would not be affected.)
How will the seasons change? (They won't.)
It is known that speed and time are related, so what effect would decreased rotation speed have on time? (This may imply a concern with relativistic effects, which are not applicable.)

f. Questions that simply repeat the questions asked

Examples:

What will be the effects of changing the speed of the earth's rotation?
What effect will the increased day have on the environment?

Note: Questions that are repeated with slightly different wording, or two questions that deal with a single issue, should be counted only once.

Examples:

Would animals be affected?
What would the effects be?

What would be the effects on the weather?
Would storms be more or less frequent?

APPENDIX IV

An Example of

FCBAP Assessments

and

Rating Criteria

ACTIVITY 4

NEWSWEEK

They're Cookin' With Wood

The Arctic-cold wind they call the "Montreal Express" is bearing down again on New England. Off and on, it will blow well into March, locking temperatures in some communities at zero and below. In Freedom, Maine, Merton and Edith Reynolds are moving their bedroom from the glassed-in front porch back to the parlor, and they've put a kettle on the stove to moisten the parched air. As it gets colder, 68-year-old Merton, a retired farmer and miller, will start getting up in the middle of the night to thump down to the basement and tend the furnace. But that's even more of an anachronism than it seems: the furnace, like the kitchen stove and the Franklin stove in the parlor, burns wood. For the price of calluses and a little lost sleep, wood lets Reynolds keep his house heated to an energy-program-be-damned 75 degrees. "It's the best kind of heat there is," he says. "It's a warmer heat that you can feel all over, right into the bones."

Wood, in fact, has exempted a good part of the state of Maine from oil crises, gas shortages and soaring fuel bills. The governor, James B. Longley, estimates that as many as 75 per cent of his constituents use it to heat their homes, some with cantankerous old furnaces like the Reynoldses', and some with newer stoves that can burn untended all night. With wood cheap and abundant in the state, sales of stoves are surging, too, and some businesses are beginning to supplement their costly oil supplies with wood. In nearby Vermont, Burlington Electric has even converted one of its three turbines to run on "cull wood"—branches, leaves, sawdust and roots—and it's not altogether unrealistic to suggest that one day all of New England will to some extent switch to a wood economy.

Ample Supply: Eighty per cent of New England consists of woodland, and according to a recent report by a Federal-regional task force, up to 30 per cent of the trees in Maine and New Hampshire could be cut down without environmental damage. Between now and the year 2000, enough wood could be harvested in New England to produce as much energy as 2.3 billion barrels of oil, or ten typical nuclear-power plants.

The wood economy is beginning to take hold elsewhere as well. In Michigan, the state power authority has agreed to buy electricity from an experimental power plant that uses wood-wastes as fuel. And in Washington state, giant Weyerhaeuser generates half of its electricity needs by burning wood scraps from its timber operations. But it's Maine that's out front. Many Down Easters, like the Reynoldses, own their own wooded acres, but those who buy wood pay about half what they would for fuel oil. Jim and Margot Boyd of Monroe, for example, spend about $300 for a winter's worth of logs, which Jim spends three hours a week cutting and splitting. An equivalent amount of oil would cost them about $700.

Maine's widening use of wood has spawned a new cottage industry: stove manufacturing. In 1974, Eva Horton of Portland went back to her native Norway to buy U.S. distribution rights for Jotul-brand stoves—and during 1977 she sold more than 25,000 of them at prices ranging from $300 to $800. For years, Bea Bryant of Thorndike scavenged old wood stoves, fixed them up and sold them as antiques. "It started out being bar and tobacco money," she says. Then came the oil embargo and sky-high fuel prices. Now Mrs. Bryant works seven days a week to keep up with orders for her $350 to $1,200 restored stoves.

Some of today's better new stoves approach the efficiency of coal burners, heating an entire house for 10 or 12 hours untended. All are based on tight control of the cold air entering the combustion chamber, and some even use thermostats to regulate the draft. Once heated, the air passes through baffle systems to assure a maximum level of dissipation through the bodies of the stoves.

Backyard Solution: A wood economy will not blossom overnight. No one as yet has designed a thoroughly reliable, long-burning wood furnace. Commercial wood-burning processes, as well, have problems. Burlington Electric reports that it often has to burn gas along with the wood to produce high enough temperatures. But the biggest obstacle to wood may be emotional. Many landowners simply don't want their trees cut. Still, more and more people are cooking and heating with wood. And while trees will never eliminate the need to import oil, there's a growing awareness that at least part of the answer to America's energy problems may be growing in its own backyard.

—DAVID PAULY with RICHARD MANNING in Maine

Bea Bryant's stove shop (above) and a fancy wood-burner in place

ACTIVITY 4

COMPETENCY: PROBLEM SOLVING

Can generalize from the solution within limits of available information.

Item: "Wood Burning"

Stimulus: NEWSWEEK, January 2, 1978, ariticle: "They're Cookin' With Wood"

QUESTION: Could the use of woodburning items provide a solution to the country-wide fuel shortages? If so, how could this be accomplished; if not, why not?

RATING SCALE - Record your judgment on line 16 of the student's computer card.

The following criteria apply to rating student responses to this question.

A grasp of the magnitude of wood consumption to solve fuel shortages should be given. Discrimination that wood as fuel would be more viable in some national areas than others. Appreciation for logistics of transporting and distributing wood to population centers. Discussion of new and improved technology to make wood burning practical and efficient.

Level 1 A

Develops a coherent argument in support of using wood or opposed to it, using at least three of the suggestions above or others of equal importance.

Level 3 C

Argues well either for or against using wood, but uses only one or two of the above or other suggestions of equal importance.

Or uses three of the above but does not develop a coherent argument.

Level 5 F

Does not argue well nor develop a coherent position.

AREA II
PROBLEM SOLVING

ACTIVITY 4

A GRADUATE CAN EVALUATE THE RESULTS OF AN ATTEMPTED SOLUTION AND GENERALIZE FROM THE SOLUTION WITHIN LIMITS OF AVAILABLE INFORMATION.

Directions:

Quickly read questions 1 and 2 before reading the article on the next page, "They're Cookin' With Wood." You will have 20 minutes to read the questions and the article and then answer the questions. During this time you should work on these questions. In responding, draw on all knowledge and skills you have acquired from any source as well as the information in the article.

1. Discuss the solution of the energy shortage (by using wood to replace conventional fuels in stoves and furnaces) from the viewpoint of at least three different consumer groups in this country, e.g. rural and urban consumer groups.

2. Could the use of woodburning items provide a solution to the country-wide fuel shortages? If so, how could this be accomplished; if not, why not?

Did you have enough time to complete this activity?

_____Yes _____No

APPENDIX V

Campus Coordinators Comments

Critical Incidences

Critical Incidences at FAMU

FAMU faculty--the same ones--were involved in field-testing the ACT/COMP battery November through March. This had several kinds of effects on our involvement with the state articulation project.

First, our experience in administering and rating the items for ACT made us somewhat "expert" on doing this for the state items.

Second, we felt we knew how to attempt to write some feasible items ourselves, and we really enjoyed doing so. (We found many ways they could have been inproved and only wished we had had more time.)

Third, we sometimes felt overburdened with deadlines from both projects on us all at the same time. In particular, at the time we were supposed to be administering and rating the state project items, we were still frantically trying to retape (video) 16 students whose tapes had been done with no sound. The mechanics of running down individual students, getting new groups of students to participate in the state items, and still maintain all our normal full-time responsibilities become overwhelming.

In general, our team was much more satisfied with ACT items than with ETS ones and we felt much better about administering and rating ACT and "homemade" ones.

In general, we had cooperation from students and faculty in administering the state battery (we did it in seven distinct classes), but one member of the team did find resistance from faculty who did not feel it was worth giving class time to.

In general, our team felt it was exciting to be involved at the "cutting edge"of new directions in assessment, but they found it frustrating to try to do so much on top of already "super-full" schedules.

CRITICAL INCIDENCES AT BROWARD COMMUNITY COLLEGE

1. As a result of just the "mention" of competencies, one other faculty member from my department (not with FCBAP) received reassigned time to work on modules for the freshman composition course. Because I was involved with FCBAP, I helped set up minimum skills for each of the five units that were distributed to five different faculty groups who then referred them, wrote objectives, selected suitable textbooks, and presented their findings to the entire department. As of this date, we are at this point.

2. Faculty members with the FCBAP project "hated" the test evaluations and found that it was "easy" to change grading criteria when students fall short of meeting the grading standards that accompanied the test. Besides that, time was a critical factor. The tests were given near the end of the term when term papers came due or final exams were given.

3. The faculty realized that in order for the project to work, all members needed to have reassigned time at the same hour and during the same term. Because we did not, we had little time to develop ideas. However, the faculty did begin to reevaluate their own classroom procedures and standards. They also began to think in terms of life competencies. One member felt that a really successful individual is one who knows how to get the information and from whom--in short, sources of information and sources of power--but none of our competencies (Draft IV) suggested either of these. Thus, we felt we needed to go back to the drawing board." What are the competencies?

Critical Incidences at UNIVERSITY OF NORTH FLORIDA

1. Gary's visit in January to hear and try to allay concern of faculty committee--probably mostly served to ventilate our concerns--very few minds were changed, but everyone had a chance to say his piece.

2. Faculty committee revolt when test items were presented. For several months they had been expressing extreme dissatisfaction with the state of the competency statements, and weren't about to give tests which they felt were only tenuously related to the competency statements.

3. Continuing incident-circumstance-problem
Make up of the committee was very fluid from the first workshop until nearly Christmas. Dr. Wharton's departure and Dr. Pease's decision not to participate left the group with no one who was really informed about and committed to the objectives of the project. Lack of released time and other evidence of institutional support made it difficult for project faculty to leave class to attend workshops, with the result that someone was missing from every workshop. If/when we ever do anything like this again, we need stronger commitment from the faculty participants, and stronger administrative support.

FSU - Bob Kromhout

1. Before I embarked on the project, I had an interview with my Dean of Arts and Science. After expressing some of my concerns and interest regarding the project, he gave me the following reactions:

   A. He did not expect to provide recompense time. I would be expected to consider the project as part of my research. He did not foresee the University doing otherwise. (This was confirmed by the VP for Academic Affairs, and has been reaffirmed since.)

2. In my discussions with my colleagues it has become fairly clear that they believe that assessment of problem solving is what they are doing on their examinations, and this is why they are unsatisfied by PSI approaches to physics, e.g. In addition they think a considerable amount of experience in application is essential as well, and that an important part of the instructor component is to provide variety of contexts and problems, as well as examples. They would be satisfied, therefore with neither competency tests above, nor with subject matter tests above, nor even with both without collegial interaction on a professional context (at the student's level).

3. In our local FSU sessions on development of competency statements and of assessment devices, several things became clear:

   A. In no area except English Communication did subject matter people agree with the project DELPHI output on the meaningfulness of the competencies (or their generic headings in some cases).

   B. There was agreement that the instruments at hand were not satisfactory, even when clever.

   C. There was general (meaning not completely universal) agreement that too much faculty time was consumed by existing assessments for the quality of the results.

Critical Incidents at MDCC

1. Administration of Institutional Competence Program wide Assessment of students Fall '77: A program wide (4-course) Assessment was administered in Fall of '77 to about 30 students in the MDCC-North competency program. The result was a learning experience for the faculty in testing. The results were of questionable value because of lack of test security among other things. However, the faculty gained experience in designing, administering, and assessing competency instruments. Note: approximate time for <u>administration only</u> was about <u>10 hrs.</u>

2. <u>(Attempted) Evaluation of ACT/Comp. Battery Winter Term 1978:</u>

   The competence team took on the task of evaluating ACT battery: This evaluation was extremely cumbersome and was eventually passed on to another evaluator. Nonetheless, it was some of the faculty's first exposure to some of the new methods of assessment which are being explored principally by the Competence movement.

3. <u>Administration of Statewide Battery Winter '78</u>
   In view of previous experience mentioned above, this went relatively smoothly. The administration method was relatively simple although it did not provide a profile of students. It was a good exercise.

4. In the Fall '77 MDCC North began a Competency Based Program in General Education including Math (General Education) - Problem solving, English (communication), Social Science, and Humanities basically upon the Competencies of the Statewide Project. The tenents of CBE were followed to varying degrees within these courses and the students enrolled where (primarily) bright freshman students.

   The program was expanded to 8 courses in the Winter term with the addition of another English course, Humanities and Social Science courses as well as an Interdisciplinary Science Program. The six faculty of the statewide project were also teaching in the institutional program and for these faculty the distinction between the two programs blurs.

APPENDIX VI

Faculty Issues

in

Competency Identification

ADDENDUM

Evaluators Report

Dr. Jeannine Webb

University of Florida

Chairperson

Ms. Martha Vlahos

Broward Community College

Dr. L. Richard Meeth

Consultant

ISSUES IN COMPETENCE IDENTIFICATION

I. Why not generate a few more of your own?

9. Is it undesirable that we all use the identical lists of competencies? Is some variety essential to future development and stability?

10. Have we had enough experience with competency assessment to write eternal lists of competencies (or list universally useful or acceptable)?

11. How can we best involve the rest of our faculties?

12. Do we agree that competencies are essential but not sufficient to define a "graduate" (at <u>any</u> level)?

13. Do we accept the Bloomian generalization that anyone can acquire these competencies given enough help, or do we need more research?

14. To attempt to set up a competency assessment program for the entire state is, in my opinion, an exercise in futility.

15. Will degrees be issued on the basis of testing alone?

16. Can a true agreement be made by all involved, as to what are generic abilities and competencies?

17. Is it necessary to establish a "whole new" program to determine if the student is competent?

18. How can we generate more concern and cooperation among all faculty?

19. How can we make certain that teachers are prepared to deal with <u>all</u> competencies for <u>all</u> students?

20. Developmental dimensions.

21. Stages of competencies-should all 8 competency domains have equal number of stages?

22. Classroom learning experiences teaching competencies. I would place greatest priority here, for those who have grasped the general competency movements, and aims. At some future sessions these classroom problems should be addressed.

23. Multiple assessment instruments for same competencies.

24. How long will it take to produce competency? Don't we have to redefine the "four year" traditional College degree?

25. Might it not take six years, 8 years; longer for some, less time for others? Won't we have to get away from "semester" courses?

26. Can valid measures of competence be developed that can be administered without causing a financial burden on the institution.

27. Can valid measures be developed that can, for the greatest portion of the measures, be scored by computer.

28. Why can't students get Bac. credit by demonstrating comp. ALONE? Why the imprisonment of classwork?

29. If we've not agreed completely on approaches, should we wait for agreement before implementing some competency based offerings?

30. Can we ever agree on assessment items?

31. Why if people involved have such unrealistic, perfectionistic goals that they will always be fault finding and unwilling to compromise?

32. Can we decide and agree upon competencies? Can we determine who will do the evaluating? Are we all capable and willing to evaluate tests?

33. I think this is a communist conspiracy - where is your love of Ivory Towers?

34. What are the chances that the Arts and Sciences faculty will accept a competency-based model of education?

35. What if students learn to communicate beautifully - yet have not learned anything valuable to say? Learn to identify values, yet have none of their own.

36. If we define output of education - solely in competency terms - what happens to content?

37. Will such a project lead to common course content?

38. Will such a project lead to common exit proficiency exams?

39. How can we ever evaluate competencies in the effective domain?

40. Will we ever resolve the question, "what is an 'educated' (competent) person?"

II. Given these issues:

a. sift out those you feel we have to deal with first (one criterion to keep in mind is whether or not the issue can be addressed in the near future or whether it's a long term problem) - and
b. suggest possible next steps for this project.

Suggestions:

We must deal on short term with 2, 3, 5, 6, 9, 10, 11, 12, and in the mediate with 8 and 13. In the long term we have 1, 4, 7.

I reject national unity, if that is what 6 suggests, but national research and dialogue is essential - we have no monopoly on competency-competence; we have neither the manpower nor time to solve all problems alone. On the other hand the problem is far too important to turn over to technologists or administrators or legislators any decisions in this area. Much more grassroots research and development is needed, involving content faculty from all areas. I believe this can be best carried out by individual institutions plus a concious and organized means of exchanging results and ideas. In both math and science we are working in a vacuum.

Refine statements of competency - develop assessments. Because I think a statewide system is unworkable, groups from individual institutions should utilize experience from this project to continue with specializations for their institutions.

Agreement as to those things identified as "generic". Agreement as to a valid assessment tool.

Construction of an acceptable assessment tool. Testing of the accepted testing tool.

Generate assessment instruments at individual institutions, test them, and report results.

Present group be divided into 3,4,5 subgroups, each working with 1-3 competencies, for 9 months, developing teaching strategies and assessment techniques in members' own classes. Periodic state-wide plenary sessions to (a) share results, (b) have resource people help clarify theory and goals.

I think the first step to take is to define minimal competence; to define competency for the state; common core of outcomes is very important. Tools to assess the above. National dialogue would be very helpful. How about organizing a National Association of Competency Based Educational Institutions - or something like this? Have annual meetings, etc.

Regarding number 2, the minimal competence should not be mediocre. Next steps for project: The project participants should always bear in mind that this task - competence test to determine whether or not a person receives a bachelor's degree - may be impossible to accomplish. The Florida Legislature may define competence-based education more along the lines of your behavioral objective definition. I like the idea of your chart wherein competence is assessed upon entry to college and is a continuous goal during the process of earning a degree. One of my primary concerns is that a requirement for a competence examination may become legislated before a gradable test can be developed. I do not think we have a test yet that could be evaluated and stand up to legal scrutiny.

Take another look at what is expected of a college graduate. Rework or look again at our competencies. Develop more assessment items. Retest. Essentially, start this experiment again.

If this is going to be done, it needs doing at campus, department levels. I would like a descriptive assessment of what competencies students already have.

Implementation: Reducing fears of neediness, failure, lack of time, etc., etc. Possible funding sources for individual institutions; efforts towards organizing a competency-based program in a number of locations in the state...
...Followed by an evaluation effort of what took place: What worked, what didn't.

5) validity of assessments comes in practice: DO something and learn from what you do.
6) start at the grass roots; give people experience; them join at state and national levels.
7) once we have out stuff together, universalize it or throw in the towel.
8) pass them
1-4) we'll find out if we do the above.

We need to be sure we can produce valid measures of the competencies which the majority of the group agrees on. Thus some more time developing a field-testing itmes, developing and trying out rating scales (and revising them until they work well) and then getting a minimal-level battery together to try out at as many institutions as will agree to do so would be valid next steps, in my opinion.

We must make some minor changes to improve the competency list. We must produce better items of our own - not coast on ACT or, God help us! - ETS items.

One problem I see is the time element. On some community college campuses some participants teach an overload or six classes. This simply does not seem to be sufficient time to develop assessment instruments. If ACT can't do the job on a first-time bases, how can we be expected to do so in less than a part-time basis? Currently our committee meets from 3 p.m. to about 6 p.m., making those days very long.

We need to agree on competencies and then develop test instruments which are manageable.

Pick one area where there is general agreement there's a problem - I suggest communication (and/or math) and assemble a group of a) communications experts and b) hardcore science, history, music, etc. faculty. Let this group work on defining competencies for this one area alone. These competencies should include a description of what is to be achieved as well as the type of assignment which will be used to measure its attainment. Then, the group should decide what will be the role of the teachers of communication courses in developing the courses, and what role, if any, will be played by other faculty members. This model should be tried out at as many institutions as will tolerate it, or only a small number of students. If it is well tolerated, and students in the experimental group do significantly better on the competence assessment than control groups then, it may be time to go further.

Better schooling of participants on writing competency statements with more specificity. Training in the application of the taxonomies for incorporation into competency statements. A task analysis of generic competencies to determine the interim performance that make up the more global competency.

Readdress the identification of competencies needed for a "contributing" or "successful" citizen without so much biased input from such academic/discipline oriented faculty who are simply protecting their little interests!

Today's session should have occurred last March. For people unfamiliar with the jargon of competency-based articulation; a seminar or two should have been conducted to educate those people as to...what is competence? What's a competence statement? etc. The basics should have been thoroughly explained before the next step was taken.

Why not identify single areas, or activities, and request a few people to concentrate on these individual areas. Let them seek help on their own from scholars in their chosen activity. e.g. A scholar in the humanities should be consulted at length about the arts and aesthetics activity. Isn't he emminently more qualified to judge this activity and what it should assess than somebody in a related field at best.

Refocus and refine competencies in a more restricted sense - i.e. Do communication first then with the knowledge and insights gained do valuing, etc., i.e. Do in pieces - go from easier to more difficult building knowledge and skills along the way. Maybe a smaller committee, 10 people? Made up of inter-disciplinary and interinstitutional people to work on a single area over the period of a term - the task could be done in pieces inexpensively (though possibly slowly and at a cost of lost broad-based support).